

## LITTELL'S LIVING AGE.

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- (1.) *The Bakerian Lecture for 1828. On a Method of rendering Platina malleable.* By W. H. WOLLASTON, M.D., V.P.R.S.
- (2.) *Philosophical Transactions for 1829. A Description of a Microscopic Doublet; On a Method of Comparing the Light of the Sun with that of the Fixed Stars; On the Water of the Mediterranean.* By W. H. WOLLASTON, M.D., V.P.R.S.

WILLIAM HYDE WOLLASTON, one of the ablest and most renowned of English chemists and natural philosophers, was born August 6, 1766, and died in December, 1828. Seventeen years have passed away since his death, and yet no biography has appeared, although he has as wide a reputation among men of science as Sir Humphrey Davy, of whom lives innumerable have been written. This has in part arisen from the comparatively retired life which Wollaston led, and the reserve and austerity of his character. He was not, like his great contemporary, a public lecturer to a highly popular institution, and thereby an object of interest, not only to men of science, but likewise to students of literature, and even to people of fashion. His life was spent in his laboratory, from which even his intimate friends were excluded; and the results of his labors were made known only by essays, published for the most part in the *Transactions of the Royal Society of London*. His discoveries, however, were so many, and of so important a kind, and made his name so widely known, that we cannot but wonder that no biography of him has yet appeared. Two of his publications, the one containing the description of a reflecting goniometer, the other explaining a process by which platina may be rendered malleable, would alone have entitled Wollaston to a place in the roll of natural philosophers worthy of lengthened remembrance. Had he been a German, some patient, painstaking fellow-countryman would long ago have put on record all that could be learned concerning his personal history. Had he been a Frenchman, an eloquent Dumas or Arago would have read his eulogy to the assembled men of science of the French capital, in language acceptable to the most learned, and intelligible to the most unscientific of men. His fate as an Englishman is, to have his memory preserved (otherwise than by his own works) only by one or two meagre and unauthenticated sketches, which scarcely tell more than that he was born, lived some sixty years, published certain papers, and died.

With the exception of some faint and imperfect glimpses of an austere taciturn solitary, perfecting wonderful discoveries in a laboratory hermetically sealed against all intruders, we learn almost nothing of the individuality of the worker. A few anecdotes, incidentally preserved in the lives of some of his contemporaries, contain nearly all that has been published concerning his personal history.

We have been informed that, soon after Wollaston's death, all the documents and materials necessary for his biography were placed in the hands of a gentleman well qualified for the task of writing it. The expected work, however, has not appeared, and, so far as we are aware, no progress has been made towards its production. We trust that the idea of publishing a life of Wollaston has not been abandoned, and that we shall yet see his personal history placed on permanent record.

Meanwhile, we think we shall do our readers a service, by bringing before them such a sketch of the philosopher, as the scanty materials at our disposal enable us to furnish. Imperfect and fragmentary as it necessarily is, it will give them some idea of a very remarkable man. An experienced crystallographer can tell from a few sandlike grains, or a single detached and rounded angle, that the crystal of which they once were parts was a perfect cube, a many-sided prism, or a symmetrical pyramid. The geologist can infer from a tooth or claw much concerning the whole animal to which it belonged. We trust that our readers will in like manner be able to piece our biographical fragments together into "one entire and perfect chrysolite;" and that they will find the palæontologist's guiding mottoes, "*Ex ungue Leonem*," "*Ex pede Herculem*," lead them to the conclusion that they are dealing with one of the *megatheria* among men of science.

William Hyde Wollaston belonged to a Staffordshire family, distinguished for several generations by their successful devotion to literature and science. His great-grandfather, the Rev. William Wollaston, was author of a work famous in its day, entitled, "*The Religion of Nature Delineated*." His father, the Rev. Francis Wollaston, of Chiselhurst, in Kent, from his own observations, made an extensive catalogue of the northern circumpolar stars, which, with an account of the instruments employed, and tables for the reductions, was published under the title of "*Fasciculus Astronomicus*," in 1800.

The subject of our memoir was the second son of the astronomer, and of Abigail Hyde, of Charterhouse square, London. He was one of seventeen children, and was born at East Dereham, a village some sixteen miles from Norwich, on the 6th of August, 1766. After the usual preparatory education, he went to Cambridge, and entered at Caius College, where he made great progress. In several of the sketches published of him, he is said to have been senior wrangler of his year; but this is a mistake, arising out of the fact, that a person of the same surname, Mr. Francis Wollaston, of Sidney Sussex College, gained the first place in 1783. Dr. Wollaston did not graduate in arts, but took the degree of M.B. in 1787, and that of M.D. in 1793. He became a fellow of Caius College soon after taking his degree, and continued one till his death. At Cambridge he resided till 1789, and astronomy appears to have been his

favorite study there, although there is evidence to show that at this time, as at a later period, he was very catholic in his scientific tastes. He probably inherited a predilection for the study of the heavenly bodies from his father, and it was increased by his intimacy with the late astronomer royal of Dublin, Dr. Brinkley, now Bishop of Cloyne, and with Mr. Pond, formerly astronomer royal of Greenwich, with whom he formed a friendship at Cambridge which lasted through life.

In 1789, he settled at Bury St. Edmunds, in Suffolk, and commenced to practise as a physician, but with so little success, probably on account of the peculiar gravity and reserve of his manner, that he soon left the place and removed to London. He succeeded, however, no better in the metropolis. Soon after reaching it, a vacancy occurred in St. George's Hospital, and Wollaston became candidate for the office of physician there. The place was gained, however, by his principal opponent, Dr. Pemberton, "who, it is said, either by superior interest, or, as is commonly supposed, by his more pleasing and polished manners, obtained the situation." It is added in several of the notices of Wollaston, "that on hearing of his failure, in a fit of pique, he declared that he would abandon the profession, and never more write a prescription, were it for his own father." This statement must be received with hesitation. So staid and sedate a person as Wollaston was, is not likely to have given utterance to the hasty and intemperate expressions attributed to him; and so prudent a man would not have bound himself by a rash vow to abandon his profession, unless he had seen the prospect of occupying himself more pleasantly and profitably in another way. This account, indeed, is in direct contradiction to another; which is so far authentic, and entitled to greater credibility, that it is contained in the report of the council of the Astronomical Society of Great Britain, presented at the anniversary meeting in 1829. In the obituary notice of Wollaston given in that report, it is mentioned, "that he continued to practise in London till the end of the year 1806, when an accession of fortune determined him to relinquish a profession he never liked, and devote himself wholly to science."

He had no occasion to regret the change even in a pecuniary point of view, the only one in which his abandonment of medicine was likely to have injured him. His process for rendering crude platina malleable, which conferred so great a service on analytical chemistry, is said to have brought him more than thirty thousand pounds, and he is alleged to have made money by several of his minor discoveries and inventions.

The remainder of Wollaston's life must be referred to in terms like to those in which the sacred writer of the Book of Chronicles finishes his brief record of each Jewish king: "Now the rest of his acts and his deeds first and last are written in the book of the kings of Israel and Judah." What the book of the Jewish kings is to their lives, the archives and records of the Royal Society are to our scientific men. Dr. Wollaston became a fellow of that society in 1793, and was made second secretary in 1806. He was for many years vice-president, and in 1820, between the death of Sir J. Banks and the election of Sir H. Davy, he occupied the president's chair. There were not a few, indeed, among the influential members of the society, who would have preferred him to Davy as permanent chairman; but Wollaston having signi-

fied his fixed intention to decline competition, gave the whole weight of his influence to Davy, and the latter was elected.

His communications to the Royal Society are thirty-nine in number, and, along with his contributions to other scientific journals, refer to a greater variety of topics than those of any other English chemist, not excepting Cavendish. In addition to essays on strictly chemical subjects, they include papers on important questions in astronomy, optics, mechanics, acoustics, mineralogy, crystallography, physiology, pathology, and botany, besides one on a question connected with the fine arts, and several describing mechanical inventions.

We shall endeavor to give the reader some idea of certain of the more important of these papers, discussing them, however, not in their chronological order, but according to a classified list.

Five are on questions of physiology and pathology, and do not admit of popular discussion. The most curious of these is a paper on "Semi-decussation of the optic nerves," and single vision with two eyes. Besides its interest as a scientific essay, it is important as having been occasioned by speculations concerning the cause of a remarkable form of blindness from which Wollaston suffered, during which he saw "only half of every object, the loss of sight being in both eyes towards the left, and of short duration only." This peculiar state of vision proved in the end to have been symptomatic of a disease of the brain, of which he died.

Eight or nine papers are on optics, but our limits will not allow us to discuss them.

Wollaston published two papers on astronomy, one "On a Method of Comparing the Light of the Sun with that of the Fixed Stars," of which we can only give the title; the other is, "On the Finite Extent of the Atmosphere," and is one of the most interesting physical essays on record. It was published in January, 1822, in the May preceding which, a transit of Venus over the sun's disk took place. Wollaston was induced in consequence to make observations on this rare and interesting phenomenon. None of the larger observatories were provided with suitable instruments for watching it, but our philosopher, with that singular ingenuity both in devising and in constructing apparatus which we shall afterwards find to have been one of his great characteristics, succeeded by a few happy contrivances in making a small telescope complete, serve the purpose. His special object in watching the passage of Venus, was to ascertain whether or not the sun has an atmosphere like that of the earth. He satisfied himself that it has not, and embodied his results in the paper, the title of which we have given.

It is a very curious attempt to decide a most difficult chemical problem by reference to an astronomical fact. The chemical question is, do the elements of compounds consist of indivisible particles, or atoms, or do they not? It is a branch of the great problem which has occupied physics and metaphysics since the dawn of speculation, in vain attempts to decide either way, viz., is matter finitely or infinitely divisible? Our author undertakes to show, not only that this difficulty may be solved, but that in fact it was solved, though no one was aware of it, as early as the discovery of the telescope, and Galileo's first observation of the eclipses of Jupiter's moons.

His mode of reasoning is as follows. If our air consist of an infinite number of particles, then as these are known to be self-repulsive, there can be

no limit to the amount of its expansion. It will spread out into space, on every side, and be found surrounding each of the heavenly bodies.

If, on the other hand, the atmosphere consist of a finite number of molecules or atoms, it will find a limit at no great distance from the earth. For the force of repulsion between the atoms will rapidly diminish as they recede from each other, till it become insufficient to oppose the counteracting force of gravity. The air will then cease to expand, and present a row of bounding molecules, prevented from falling towards the earth by the repulsion of the particles between it and them, and from receding from the earth by their own weight. The conclusion from this reasoning is, that if astronomy can show that any one of the heavenly bodies has not an atmosphere of the same nature as ours, chemistry will be entitled, and indeed compelled, to infer, first, that our atmosphere, and then that all matter, consists of finitely divisible particles or true atoms.

The astronomical problem is easily and speedily solved. The moon is *too near* us, to permit of observations of the necessary kind being made, as to her possession of an atmosphere similar in constitution to ours; but according to telescopic observation, she is a naked globe. The phenomena presented when Venus or Mercury passes close to the sun, certify that he has no atmosphere like that of the earth; but his high temperature, and its possible effect on an atmosphere, if he have one, somewhat lessen the value of the fact. Jupiter, however, and his five moons, admit of observations which make it certain that our aerial envelope has not reached to that heavenly body.\* When his satellites suffer eclipse by passing behind him, they appear to a spectator on the earth, to move across his disk till they reach its edge, when they instantaneously disappear. When they reappear, after moving round him, they emerge in a moment from behind his body, and start at once into full view. Had Jupiter an atmosphere like ours, the occultation of his satellites would not occur as it is observed to do. Our sun, when he sinks below the horizon, remains visible to us by the light bent up or refracted to our eyes, through the transparent air, and twilight slowly darkens into night. In like manner, long before the rising sun would be seen, if our globe were naked, the air sends up his rays to our eyes, and he becomes visible. If Jupiter had an atmosphere like that of the earth, each of his moons, instead of disappearing at once behind his disk, would exhibit a twilight recession, and slowly wane away. When it returned, it would be seen much sooner, after being lost sight of, than it is at present, and would gradually wax brighter and brighter till it came fully into view. In other words, the atmosphere of Jupiter would send back the light of the satellite to us, after the latter disappeared behind the planet; and would send forward that light before the moon reappeared. Wollaston shows that, in the case last supposed, the fourth satellite would never be eclipsed, but would remain visible when at the very back of the planet.

\* The reader will observe that the argument is based, not on the fact of the heavenly bodies lacking atmospheres, which some of them may possess, but on their wanting atmospheres of the same nature as ours. We cannot apply chemistry to ascertain whether oxygen and nitrogen, or the other gases of our atmosphere, envelope distant globes; but we can bring optics to discover whether a power to refract light such as our air possesses, exists around any of these spheres. From the text it will be seen that no such power has been observed in any case.

It is certain, then, that the earth's atmosphere is limited, and according to Wollaston it is equally sure that matter is only finitely divisible.

The paper we are discussing excited great attention among men of science; and for a long period, though few implicitly assented to the validity of the argument, no one appeared able to detect any fallacy in its reasoning. It was commented on by Faraday, Graham, Turner, and Daubeny, as an important contribution to chemistry; and referred to by Dumas as the only attempt which had been made in modern times to decide by physics the question of the finite or infinite divisibility of matter. More recently, it has been shown that the fact that the atmosphere is limited will not justify the conclusion which Wollaston deduced from it.

It has been suggested by Dumas, following out the views of Poisson, that the low temperature which is known to prevail in the upper regions of the atmosphere, may be such at its boundary as to destroy the elasticity of the air, and even to condense it into a liquid or freeze it into a solid. The outer envelope of our atmosphere is thus supposed to be a shell of frozen air. If this view be just, our atmosphere is limited, not because it consists of atoms, but simply because a great cold prevails in its upper regions.

Professor Whewell has shown that Wollaston was not entitled to assume that the law which connects the density of the air with the compressing force is the same at the limit of the atmosphere, as it is near the surface of the earth. He suggests a different law which may prevail, and which would terminate the atmosphere without the assumption of atoms.

Lastly, it has been pointed out, that though all Wollaston's postulates were granted him, they would only entitle him to infer that the atmosphere consists of a finite number of repelling molecules. To establish this, is to establish nothing. We are still on the threshold of the argument. Each molecule supplies as good a text whereon to discuss the question of divisibility, as the whole atmosphere out of which it was taken. The point which most of all demanded proof, namely, that the molecule was an atom, was the very one which Wollaston took for granted.

Beautiful, then, and certain as are the astronomical facts brought to light by Wollaston, they supply no decision of the question of the divisibility of matter. That problem still presents the same two-fold aspect of difficulty which it has ever exhibited. If we affirm that matter is infinitely divisible, we assert the apparent contradiction, that a finite whole contains an infinite number of parts. If, pressed by this difficulty, we seek to prove that the parts are as finite as the whole they make up, we fail in our attempt. We can never exhibit the finite factors of our finite whole; and the so-called atom always proves as divisible as the mass out of which it was extracted. Finiteness and infinity must both be believed in; but here, as in other departments of knowledge, we cannot reconcile them.

The greater number of Wollaston's strictly chemical papers, with the exception of those referring to physiology and pathology, are devoted to the exposition of points connected with the chemistry of the metals. He was the discoverer of palladium and rhodium, once interesting only as chemical curiosities, but now finding important uses in the arts. He discovered, also, the identity of columbium and tantalum. He was the first to re-



cognize the existence of metallic titanium in the slags of iron furnaces; and he is the deviser of the important process by which platina is rendered malleable. He published, also, analyses of meteoric iron, and showed that potash exists in sea water.

The majority of the essays in which these discoveries were made known, are of too limited and technical a character to admit of notice in the pages of our journal. There is one of them, however, that, "on a process by which platina may be rendered malleable," which cannot be dismissed without a word of explanation.

It must seem curious to a general reader, that much value should be attached to a mere metallurgical process, however ingenious. He will be further perplexed by learning that the Royal Society, passing over Wollaston's claims to reward, as the author of important speculative, and purely scientific papers, selected this essay as the object of their special commendation. The strong words used by the council of the society are, "Your council have deemed themselves bound to express their strong approbation of this interesting memoir by awarding a royal medal to its author, and they anticipate with confidence a general approbation of what they have done." It may help the reader to understand why the paper in question is esteemed so highly if he be made aware of the following facts.

Among other bodies which the alchemists of the middle ages thought it possible to discover, and accordingly sought after, was a Universal Solvent, or *Alkahest* as they named it. This imaginary fluid was to possess the power of dissolving every substance, whatever its nature, and to reduce all kinds of matter to the liquid form. It does not seem to have occurred to these ingenious dreamers to consider, that what dissolved everything, could be preserved in nothing. Of what shall we construct the vessel in which a fluid is to be kept, which hungers after all things, and can eat its way through adamant as swiftly as water steals through walls of ice? A universal solvent must require an equally universal *non solubile* in which it may be retained for use.

The modern chemist's desire has lain in the opposite direction from that of his alchemical forefather. It is the *non solubile*, not the solvent, that he has sought after, and Wollaston supplied him with that in malleable platina. Long before the close of last century, the chemical analyst found the reagents he had occasion to make use of, alkalis or universal solvents enough, for the vessels in which he could contain them. For the greater number of purposes, glass and porcelain resist sufficiently the action of even the strongest acids, alkalies, and other powerful solvents. In some cases, however, they are attacked by these, and cannot be employed in accurate analysis. Whenever, moreover, it is necessary to subject bodies to a high temperature along with active reagents, as, for example, in the fusion of minerals with alkalies, porcelain can seldom be employed, and is often worse than useless.

It was in vain that chemists had recourse to silver and gold, as substitutes for the insufficient clay in the construction of their crucibles. These metals melt at comparatively low temperatures, and, before a sufficient heat can be attained to fuse the more refractory substances enclosed in them, they run into liquids, and the crucible and its contents are lost in a useless slag.

In consequence of this insufficiency of his tools, the analytical chemist was brought to a complete stand. Whole departments of his science lay around him unexplored and unconquered, tempting him by their beauty and their promise. He could only, however, fold his arms and gaze wistfully at them, like a defeated engineer before a city which his artillery and engines have failed to subdue.

It was at this crisis that Wollaston came forward to put a new weapon into the hands of the chemical analyst. Several years before he turned his attention to the subject, scattered grains of a brilliant metal had been found in the sands of certain of the South American rivers. To this, from its resemblance to silver, or in their language *plata*, the Spaniards gave the name of *platina*, or little silver. This metal was found to resist the action of nearly every substance except *aqua regia*; to suffer no change, nor to become rusted by protracted exposure to the atmosphere; and to be perfectly infusible by the most powerful forge or furnace.

Here then was a substance for the chemist's crucible, could a method of working it only be discovered. But the very properties which made its value certain, if it were wrought into vessels, forbade its being easily fashioned into them. It occurred in nature only in small grains which could not be melted, so that it was impossible, as with most other metals, to convert it into utensils by fusion. Neither was it possible by hammering to consolidate the grains into considerable masses, so that vessels could be beaten out of them, for the crude metal is very impure. Accordingly, it happened, that for years after the value of *platina* had been discovered, it could not be turned to account. Whole cargoes of the native metal, although it is now six times more costly than silver, are said to have lain unpurchased for years in London, before Wollaston devised his method of working it.

That method was founded upon the property which *platina* possesses of agglutinating at a high temperature, though not melted, in the way iron does, so that, like that metal, it can be welded, and different pieces forged into one. This property could not, however, be directly applied to the native grains owing to their impurity and irregularity in form.

Wollaston commenced by dissolving the metal in *aqua regia*; purified it whilst in solution from the greater number of accompanying substances which alloyed it; and then, by the addition of sal ammoniac, precipitated it as an insoluble compound with chlorine and muriate of ammonia. When this compound was heated, these bodies were dissipated in vapor, and left the *platina* in the state of a fine black powder, which was further purified by washing with water.

It was only further necessary to fill a proper mould with this powder well moistened, and to subject it to powerful compression. By this process the powder cohered into a tolerably solid mass, which was gently heated by a charcoal fire, so as to expel the moisture and give it greater tenacity. It was afterwards subjected to the intensest heat of a wind furnace, and hammered while hot, so as completely to agglutinate its particles, and convert it into a solid ingot. This ingot or bar could then be flattened into leaf, drawn into wire, or submitted to any of the processes by which the most ductile metals are wrought.



We have passed over unnoticed many practical minutiae essential to the success of Wollaston's process. The reader is more concerned to know that the platina crucible has been one of the chief causes of the rapid improvement which chemistry has recently undergone, and that it is an indispensable instrument in the laboratory. The costliness of the metal has not forbidden its application to manufacturing operations even on the largest scale. In the oil of vitriol works, stills of platina are made use of for distilling sulphuric acid, each of which, though holding only a few gallons, costs above a thousand pounds. A coinage of platina was introduced into the Russian dominions, which possess valuable supplies of its ores; but though roubles and other coins struck in it, occasionally reach this country as curiosities, we understand that the coinage has been withdrawn by the imperial government, in consequence of the fluctuations that occur in the value of the metal.

In our own country, from the great consumption of platina in chemical processes, its value has rapidly risen even within the last few months; but it is constantly shifting.\* Nothing but its rarity and costliness prevent its application to the construction of every kind of culinary vessel, for which its purity, cleanliness, and enduringness especially fit it. A thousand other uses would be found for it, if it were more abundant.

Were it now the custom to honor men after death according to the fashion of the Greeks and Romans, Wollaston's ashes would be consigned to a gigantic platina crucible, as to a befitting and imperishable sepulchral urn.

His other chemical papers are all important. One of them, "on the chemical production and agency of electricity," proved, by singularly ingenious and beautiful experiments, that identity of voltaic and friction electricity, which Faraday has since confirmed by still more decisive trials. The others had reference chiefly to the atomic theory, which Wollaston was a great means of introducing to the favorable notice of chemists. One was "On superacid and subacid salts," and contained one of the earliest and most convincing proofs which can be given of the existence of such a law of multiple proportion, as Dalton had announced. The other on "A synoptical scale of chemical equivalents," first brought the laws of combination within the reach of the student and manufacturer.

Wollaston published three papers on the shapes of crystals, and on the mode of measuring them. No branch of science is less inviting to the general student than crystallography. Nevertheless, we must be allowed to refer briefly to one of Wollaston's essays on that subject. The most superficial sketch of the philosopher whose works we are considering, would be inexcusably defective if it passed it by.

The paper we refer to is entitled, "Description of a reflective goniometer," and, next to that containing the account of the platina process, is perhaps Wollaston's most important contribution to science. It is much more difficult, however, to convey an idea of its value, than it was in the case of that essay.

\* Platina costs at present, in the state of ingot or bar, from 30s. to 35s. per ounce, wholesale. Manufactured articles from 32s. to 42s. per ounce, also wholesale. The retail prices are from 5s. to 10s. higher. Virgin silver sells at 5s. 9d. per ounce, wholesale; at 9s. per ounce, retail, when manufactured. Sterling silver is worth 4s. 11d. per ounce.

There are no bodies, perhaps, more interesting to a greater number of persons than crystals. The rarer native ones which we name gems, rank with the precious metals in expressing by the smallest bulk the greatest commercial value. The precious stones have been hallowed in the minds of many from their earliest days, by the terms in which they are alluded to in the Bible. The lavish use made of them in adorning the dress of the Jewish high priest; the manifold references to them in the books of the prophets, and in the more impassioned writings of the Old Testament; and most of all the striking and magnificent way in which they are referred to by St. John as types of the glories of the world to come, must satisfy even the most careless reader of the Scriptures, that God has marked them out as emblems of indestructibility, rarity, worth, beauty, and purity. Their appropriateness for this purpose must strike every one. The painter has counted it a triumph of his art to imitate even imperfectly their colors and brilliancy. Poets have all loved to sing of them. Beauty, in every age and clime, barbaric and civilized, however much she has loved caprice in other things, and has complained of ennui and satiety, seems never to have tired of her rubies and emeralds, or to have grown weary of admiring her "family diamonds."

And if the symbolical, æsthetical, fictitious and commercial value of crystals has been great, their worth to the man of science has not been small. The mineralogist counts them the most precious treasures of his cabinet. The geologist defines and marks out rocks by them. The electrician has detected curious phenomena by means of their aid. The investigator of the laws of heat finds them of indispensable service in studying his subject. The optician is indebted to them for the greatest generalization of his science, and for the discovery of many of its most delightful, though most intricate departments. Recently they have been declared to present remarkable and hitherto unsuspected relations to magnetism. The chemist considers a knowledge of crystallography absolutely requisite, not merely as enabling him to identify substances without the trouble of analyzing them, but likewise as unfolding analogies of the greatest importance in relation to the classification of chemical compounds. Medical men have discovered that, in many dangerous disorders, crystals show themselves in the fluids of the body, and now study their shapes with the utmost care as a means of detecting and alleviating disease. Finally, the greatest mathematicians have counted it a worthy occupation to investigate the forms and geometrical relations of crystals. We need only remind our scientific readers of the labors of Huyghens, Young, Fresnel, Arago, Brewster, Sir William Hamilton of Dublin, Herschel, Mohs, Weiss, Mitscherlich, Faraday, not to mention a multitude of others, to satisfy them that we have not overstated matters. The undulatory hypothesis of light, the laws of its double refraction, and those of its polarization, have been suggested or discovered by observations with crystals. The same remark applies to the laws of the radiation and polarization of heat, and with limitations might be extended to other branches of natural philosophy. There is not, indeed, a single physical science which has not an interest in crystallography.

From this brief statement it will appear, that nearly every class of scientific men was certain to

gain by the invention of an instrument, which promised greatly to facilitate, and to render more accurate, the study of crystals. We will not say that the poet, the painter, or the beauty owed Wollaston any thanks. They did not, at least, immediately; but in the end it may appear, and it would not perhaps be difficult to demonstrate, that they are all gainers by the progress of science. We return, however, to the reflective goniometer.

A goniometer, as its name implies, (*gonia*, an angle, *metron*, a measure,) is an instrument for measuring angles. The appellation, though susceptible, of course, of much wider application, is restricted to an apparatus for measuring the angles of crystals. Different goniometers were in use before Wollaston invented his, but they were comparatively rude, and could only be applied to large crystals. This limitation of their employment was doubly disadvantageous. Many substances can be obtained only in minute crystals. In every case, small crystals are *ceteris paribus* more perfect than large ones. Wollaston's instrument not only applied to very diminutive crystals, but gave more accurate results the smaller the crystal was, provided only it were visible. It was able to do this from the peculiarity of its principle, which lies in this, that instead of measuring the angle formed by the meeting of two faces of a crystal directly, it measures the angle formed by the meeting of rays of light reflected from them. It requires, in consequence, only that the crystal shall be large enough to have visible faces, and that these shall be sufficiently smooth to reflect light.

When Wollaston published the account of his goniometer, he stated as an evidence of its superiority to those previously in use, that whereas a certain angle of Iceland spar was reputed to be of one hundred and four degrees, twenty-eight minutes, forty seconds, it was in reality of one hundred and five degrees.

It cannot but seem surprising that it should be of interest to a mineralogist or chemist, to know that the angle of a crystal is by half a degree greater or smaller than it has been supposed to be. The importance of the observation arises out of the fact, that a great number of substances which assume the solid form affect perfectly regular shapes, or, as we say, crystallize. The figures which they thus present are not inconstant and uncertain, but, within prescribed and narrow limits, are perfectly fixed and invariable. Common salt, for example, the greater number of the metals, and many other bodies, when they occur as crystals, show themselves as cubes, or solid six-sided figures, with all the faces squares, and all the angles right angles. The well-known doubly-refracting Iceland spar (carbonate of lime) crystallizes in an equally regular and perfect, but different shape. Its crystals are six-sided, but the faces are rhombs, or resemble the diamond on a pack of cards, and its angles are not right angles. From extended observations on the crystalline shapes of bodies, the important law has been generalized, that "the same chemical compound always assumes, with the utmost precision, the same geometrical form." This enunciation of the law must be accepted with certain important qualifications and exceptions, which our limits do not permit us to dwell upon. This one point, however, we are anxious to explain: the constancy of form affirmed to exist in crystals does not manifest itself "in equality of the sides or faces of the figures, but in the equality of the angles." It is the angle, therefore, and not the face of a

crystal, which is important, the latter *may* vary, the former *must* not; hence the value of a goniometer, or angle measurer.

Again, many crystals have the same general shape. A very common form, for example, is an octahedron, or double four-sided pyramid, arranged, like two Egyptian pyramids placed base to base. But though the general configuration is similar, the angles at which the faces of the pyramids incline towards each other are different in different substances, and distinguish each crystal from all its fellows. Yet the differences in angular inclination, though constant, are often very small; hence the importance of the reflective goniometer, as enabling the observer to detect the slightest difference in angular value between apparently similar crystals. For the trouble of a tedious analysis, and the sacrifice of perhaps a rare substance, we are thus frequently able to substitute the simple device of measuring the angle of its crystals.

The fact has a general interest, also. To the law which the goniometer has discovered, we are indebted, for the exquisite symmetry and perfection of shape which make crystals, like flowers, delightful objects merely to gaze at. They may be crushed to fragments, or dissolved in fluids, or liquefied by heat, or dissipated in vapor, but they grow up again like trees from their roots, or flowers from their seeds, and exhibit their old shapes with a fidelity and exactitude of resemblance, which no tree or flower ever showed or can show. We heard much of the restoration of the recumbent warriors in the Temple church of London, and still more of the skill shown in piecing together the broken fragments of the Portland vase; but all such restorations are poor and faint imitations of the art, with which nature not only restores but reproduces the works of her chisel.

Were all the crystals in the world reduced to dust, in good time they would each reappear. The painter and the poet would not only find the tints, and play of color, and sparkle, exactly as before, but the mathematician would try in vain to discover the smallest fractional difference in the value of their angles. Unity in variety is the voice of all nature; but in the case of crystals, the unity almost pushes the variety aside.

To descend from these speculations, the reader will understand, that as every crystallizable substance has an unchangeable form peculiar to itself, the crystalline figure of a body is an important character by which it may be recognized and identified.

But this is the lesser service which the reflective goniometer has rendered to science. Early in this century, a great German chemist, Mitscherlich, comparing the results obtained by Wollaston's instrument, with those procured by analysis, in the case of crystalline bodies, discovered a very curious and unexpected law. It appeared, that when substances resemble each other in chemical characters, their crystalline forms are also similar. When the similarity in chemical properties is very great, the shapes become absolutely identical. It is a very singular circumstance, which no one appears to have in the least anticipated, that where two closely-allied bodies, such as arsenic and phosphorus, unite with the same third substance, they should produce identical forms when the respective compounds are crystallized. Each face of the one slopes at the same angle as the same face of the other. A mould of a crystal of the one would fit a crystal of the same size of the other. A goni-

ometer set at the angle of the one, would exactly measure the angle of the other. Such crystals are named isomorphous, a Greek word synonymous with the Latin one, similiform, also made use of.

Taught by this law, the chemist, to his astonishment, found himself able to ascertain chemical analogies by measuring angles of crystals, and supplied with a means of controlling and explaining the results of analyses, which otherwise seemed only to lead to contradiction and confusion. Crystalline form is now one of the first things attended to in classifying chemical substances, and is the basis of most of our attempts to arrange them into groups and natural families.

We cannot delay on this curious subject. Suffice it to say that the announcement by Mitscherlich of the law of isomorphism at once overthrew the prevailing systems of mineralogy, and demanded their complete reconstruction. It changed, also, the aspect of chemistry, and where its influence on that science will end we cannot yet tell.

It deserves especial notice, but has never obtained it, in histories of the progress of chemistry, that he who, by his gift of the platina crucible, enabled his brethren to extend the whole science, and especially to subject every mineral to analysis, by his other gift of the reflective goniometer showed them how to marshal their discoveries. The latter instrument has been to the chemist like a compass-needle or theodolite to the settlers in a strange country. By means of it, he has surveyed and mapped out the territory he has won, so that new comers may readily understand the features of the district; and has laid down pathways and roads, along which his successors may securely travel.

A mere list of papers is a dull thing, of no interest to those acquainted with the papers themselves, and of little value to those who are not. The reader, however, must bear with us a little, whilst we bring briefly before him three other essays by Wollaston; they are all curious, and, besides their intrinsic value, are important as illustrating the versatility of his mind, and the singular accuracy of all his observations.

One of them is on the interesting and poetical subject of "Fairy rings." Most persons in this country must be familiar with the circles of dark green grass which are frequently seen in natural pastures, or on ground which has long lain unploughed. They are particularly abundant on commons and in sheep-walks, such as the chalk-downs in the south of England. Their dimensions are so great, and they are so symmetrical, and so much darker in color than the surrounding herbage, that they never fail to attract the attention of even the most careless passer by. These circles, a beautiful rural superstition supposes to have been marked out by the feet of fairies, whirling round in their midnight dances: they have, in consequence, been named fairy rings. It is well known, also, that they gradually increase in dimensions: in certain cases, even by as much as two feet in a single year. A believer in elves might suppose that the fairies, from time to time, admitted their children to their pastimes, when they were done with the dancing-school and fit for presentation, or in other ways added new guests to their parties, and required more spacious waltzing-ground.

These beautiful and mysterious circles the chemist would not leave to the poet. Keats has complained that—

"There was a glorious rainbow once in heaven;

'T is numbered now amongst the catalogue  
Of common things.'

Science, which would not spare the rainbow, has had no mercy on the fairy rings; though, in truth, both the one and the other still are, and ever will be, as truly the possession of the poet as they were of old. There is no one, we suppose, who does not sympathize with the poetical rendering of the fairy ring; and no one, probably, who does not at the same time wish to know what the scientific version is also. Wollaston furnished us with the latter. He was led to form the opinion we are about to state, by noticing "that some species of fungi were always to be found at the margin of the dark ring of grass, if examined at the proper season." This led him to make more careful observations, and he came to the conclusion that the formation of the ring was entirely owing to the action of the fungi in the following way. In the centre of each circle, a clump or group of toadstools or mushrooms had once flourished, till the soil, completely exhausted by their continued growth on it, refused to support them any longer. The following year, accordingly, the toadstools which sprang from the spawn of the preceding generation, spread outwards from the original spot of growth towards the unexhausted outer soil. In this way, a barren central place came to be surrounded by a ring of fungi, year by year increasing in diameter, as it exhausted the earth it grew upon, and travelled outwards in search of virgin soil. But this was not all. The toadstools, as they died, manured or fertilized the ground, so that, although for a certain period the place where they had grown was barren, by-and-bye the grass flourished there more luxuriantly than elsewhere, and manifested this by its greater length and deeper color. In this way, each circle of mushrooms came to be preceded by a ring of withered grass, and succeeded by one of the deepest verdure, and as the one increased the others did also.

On Salisbury plain, near Stonehenge, where, as in a hallowed and befitting locality, fairy rings abound, we have tested the truth of Wollaston's view. The sides of the low mounds which cover that plain are variegated by the circles in question. A few are imperfect; quadrants and semicircles; the greater number wonderfully symmetrical, and to appearance completely circular. The latter exhibit with great uniformity the phenomena which Wollaston describes. A plot of grass, resembling in tint and appearance the ordinary herbage of the down, stands in the centre of a dark green ring five or six feet in diameter. This is fringed by a forest of fungi, and they in their turn are bounded by a circle of stunted, withered grass. This last phenomenon was quite in keeping with Wollaston's theory of the origin of fairy rings. He observes that "during the growth of fungi they so entirely absorb all nutriment from the soil beneath, that the herbage is often for a while destroyed, and a ring appears bare of grass surrounding the dark ring; but after the fungi have ceased to appear, the soil where they had grown becomes darker, and the grass soon vegetates again with peculiar vigor." These views of Wollaston have been beautifully confirmed by the recent researches of Professor Schlossberger of Tübingen, into the chemical compositions of the fungi, by which it appears that they contain a larger quantity of nitrogen, of phosphates, and of other salts, than any of our cultivated vegetables. In consequence of this, they must exhaust the soil more when they grow on it, and



on the other hand fertilize it more, when restored to it; than any other plants. Dr. Schlossberger has accordingly recommended the employment of the fungi as manures.\*

We conclude this subject by remarking that our great poet, who had an eye for everything, connects fairy rings and mushrooms together, almost as if he had anticipated Wollaston. Our readers will remember the passage in the *Tempest*:

"You demy-puppets, that  
By moonshine do the green sour ringlets make,  
Whereof the ewe not bites; and you, whose pas-  
time  
Is to make midnight mushrooms."

In another, and one of the most curious of his papers, Wollaston again plays the part of disenchanter of a poetical fancy.

It is entitled, "On the apparent direction of the Eyes of a Portrait." Into this essay we cannot enter at length, but it deserves a word of notice. One large part of it is occupied in showing that we are unconsciously guided in our estimate of the direction in which the eyes of another are turned, not merely by the position of the iris (or colored circle) and whites of these eyes, but likewise by the direction of the concurrent features, particularly those which are more prominent, as the nose and forehead. However unexpected this statement may be, or perplexing the explanation of it, Wollaston puts it out of the power of the least credulous of his readers to deny the fact, by the plates which accompany his paper. In these he shows that the same pair of eyes may be made to look up, or down, or to either side, merely by altering the direction of the nose and forehead which accompany them. In this paper, also, he supplies an explanation of the familiar fact, that "if the eyes of a portrait look at the spectator placed in front of the picture, they appear to follow him in every other direction."

We need not remind the reader how many allusions are made to this optical phenomenon in the works of our poets and novelists, with whom it has ever been a favorite engine for cheering, terrifying, or instructing their heroes. Here, for example, is one of Sir Walter Scott's many references to it. When Colonel Everard visited Woodstock lodge, where an ancient family portrait hung upon the walls, "He remembered how, when left alone in the apartment, the searching eye of the old warrior seemed always bent upon his, in whatever part of the room he placed himself, and how his childish imagination was perturbed at a phenomenon for which he could not account."

It did not escape Shakspeare. To take a single case. When Bassanio opens the leaden casket, and beholds Portia's portrait, he exclaims

"Move these eyes?  
Or whether, riding on the balls of mine,  
Seem they in motion?"

A beautiful poem of Mrs. Southey's, "On the removal of some Family Portraits," turns almost entirely on the subject we are discussing. The explanation is very simple. The only portraits which exhibit the ubiquity of look referred to, are those which have the face and eyes represented as directed straight forwards. A certain deviation from absolute straightforwardness of look may occur, with-

out the phenomenon disappearing, although in that case it will be less apparent; but if the face and eyes are much turned to one side, it is not observed. In a front face, the same breadth of forehead, cheek, chin, &c., is depicted on either side of the nose, considered as a middle line. The eye, also, is drawn with its iris or colored ring in the centre, and the white of the eye shown to the same extent on each side of the iris. In a countenance so represented, if the eye appear fixed on the spectator when he stands in front of the portrait, it will continue to gaze on him, from whatever point he regards the picture. If, for example, he place himself far to the one side of the painting, the breadth of the face will appear much diminished. But this horizontal diminution will tell on the whole face equally, and will not alter the relative position of its parts. The nose will still appear with as much breadth of face on the one side as on the other, and therefore stand in the centre. The iris will still exhibit the same breadth of white to the right and to the left, and continue therefore to show itself in the middle of the eye. The countenance, in fact, will still be directed straight forward, and its expression remain unchanged.

One other reference will conclude our discussion of Wollaston's Essays. The last paper we mention is, "On Sounds inaudible to certain ears." Its object is to point out, that while in the natural healthy state of the ear, there seems to be no limit to the power of discerning low sounds, in many persons who are otherwise quite free from deafness, there exists a total insensibility to high or shrill notes, so that they are quite deaf to these. The hearing of different persons was found by Wollaston to terminate at a note four or five octaves above the middle E of the pianoforte. His own hearing ceased at six octaves above that note. Those who were thus deaf to high notes were, in consequence, quite insensible to the chirping of the grasshopper, the cricket, the sparrow, and the bat. With these observations Wollaston connects a beautiful speculation as to the possibility of insects both emitting and listening to shrill sounds, which we never hear; whilst they, in like manner, are totally deaf to the graver notes which only affect our ears. We quote his own words:—

"The range of human hearing includes more than nine octaves, the whole of which are distinct to most ears, though the vibrations of a note at the higher extreme are six hundred or seven hundred times more frequent than those which constitute the gravest audible sound.

"As vibrations incomparably more frequent may exist, we may imagine that animals like the grylli, (grasshoppers, crickets, molecrickets, &c.) whose powers appear to commence nearly where ours terminate, may hear still sharper sounds which we do not know to exist; and that there may be insects hearing nothing in common with us, but endued with the power of exciting, and a sense that hears the same vibrations which constitute our ordinary sounds, but so remote, that the animal which perceives them may be said to possess another sense, agreeing with our own, solely in the medium by which it is excited, and possibly wholly unaffected by those slower vibrations of which we are sensible."

This seems to us a striking and beautiful idea, and suggests many thoughts. It is in a fine sense a fulfilment of St. Paul's declaration, "There are, it may be, so many kinds of voices in the world, and none of them is without signification."

Such is a most perfect list of the additions made

\* We have seen fields lying fallow in the south of England, because, as was alleged, they would not bear crops, although they were thickly covered with edible mushrooms. Where the latter grow freely, wheat, and the other grains, are certain to flourish also.

by a single philosopher to the scientific literature of our country; and he a private gentleman, working without help from government or any other extrinsic aid. Several of the essays we have referred to, were read before the Royal Society of London in the last year of the author's life, under circumstances which invest them with peculiar interest. Towards the latter part of the year 1828, Wollaston became dangerously ill of the disease of the brain, of which he died. His complaint was a painful one, and it speedily showed such symptoms as satisfied the sufferer himself that death was at hand. He acted on the information as if the warning of coming dissolution had been accompanied by the same advice which was given to king Hezekiah in similar circumstances, "Set thine house in order, for thou shalt die and not live." Finding himself unable to write out an account of such of his discoveries and inventions as he was reluctant should perish with him, he spent his numbered hours in dictating to an amanuensis an account of some of the more important of them. These parting gifts of a dying philosopher to his brethren will be found in the papers bearing his name which are printed in the *Philosophical Transactions* for 1829. We have placed their titles at the head of our article. In one of them he makes a touching allusion to the unaccustomed haste which he had been obliged to exhibit in drawing it up. No indications of haste, however, appear in the essay in question, or in any of the others referred to. One of them is the account of the process for working platina, and, like Wollaston's other papers, is a model of what a physical essay should be.

These were not his only legacies to science. Shortly before his death, he wrote a letter to the secretary of the Royal Society, informing him that he had that day invested, in the name of the society, stock to the amount of £1000. The interest of this money he wished to be employed in the encouragement of experiments in natural philosophy. A Wollaston medal is accordingly given periodically by the Royal Society.

In the June before his death, he was proposed as a member of the Astronomical Society of London; but, according to the rules of that body, he could not have been elected before their last meeting for the year. When the society met in November, 1828, however, the alarming situation of his health, and the great probability of his dissolution previous to the December meeting, induced the council at once to recommend to the assembled members a departure from the established rule, and that the election should take place at that sitting. This was done, and received the unanimous sanction of the meeting, which insisted on dispensing with even the formality of a ballot. Dr. Wollaston, then within a few days of his death, acknowledged this feeling and courteous act by presenting the society with a valuable telescope, which he greatly prized. It originally belonged to his father, and had been subsequently improved by the application to it of an invention of his own, that of the triple achromatic object glass, a device on which astronomers set great value.

It is impossible to turn from the record of these incidents, without a feeling of strong admiration of the old Roman-like resolution and calm courage with which the suffering philosopher waited for death. We are all too apt to admire only the active agonistic courage of the battle field, or other arena of energetic and laborious warfare or struggle; and are prone to let our imaginations kindle

over pictures of warriors dying at the moment of victory, covered, as we are pleased to say, with glory. It is well that we should admire these, for so noble a quality as courage must be honored in all its rightful manifestations. Nevertheless, there are not a few who would prove heroic enough before a visible foe, but would quail before the solitary approach of the "last enemy." They could endure even to the death, when surrounded by hundreds involved in the same peril, and stirred by the same impulse as themselves; but would lack something of their courage if the influence of numbers and the sympathy of fellow-sufferers were gone, and the excitement of active and manifest struggle were wanting. There are not many who, laid on a sick bed as Wollaston was, and certain that recovery was hopeless, would have so risen above the terror of death, and the distraction of pain, as to work as if health were in possession, and long life in prospect. The great majority would think they did well if they submitted to their fate with some show of decent gravity, and made no unmanly complaint; whilst every solace that could be furnished was applied to smooth the way to the tomb. We cannot, therefore, but highly honor the resolute man of science, who did not permit sickness, or suffering, or coming death, to prevent him from putting on record the otherwise lost knowledge, which he thought might serve the cause of truth and benefit his fellow-men.

It would have been in the highest degree interesting to have known what were the grounds of this notable courage, and with what feelings Wollaston not only prepared to leave this world, but looked forward to a world to come. We long to learn whether it be but constitutional calmness and stoicism such as a Greek or Roman might have shown, or fortitude such as only a Christian can display, that we are called on to admire in the dying philosopher. But none of those who alone were entitled to speak on this point have given us information concerning it; and we forbear to form any conjectures. Whencesoever derived, Wollaston's steadfast resolution continued to the end. When he was nearly in the last agonies, one of his friends having observed, loud enough for him to hear, that he was not at the time conscious of what was passing around him, he immediately made a sign for a pencil and paper, which were given him. He then wrote down some figures, and, after casting up the sum, returned them. The amount was right. He died on the twenty-second of December, 1828, aged sixty-two, a few months before his great scientific contemporaries, Sir Humphrey Davy and Dr. Thomas Young. After death, it appeared that that portion of the brain from which the optic nerve arises was occupied by a large tumor. If we are right in thinking that the singular one-sided blindness from which he sometimes suffered was an early symptom of this malady, it must have proceeded very slowly, for his paper on the semi-decussation of the optic nerves was published in 1824. It is interesting for the sake of psychology to know, that in spite of the extensive cerebral disease referred to, Wollaston's faculties were unclouded to the last.

There remains but little to be told. No picturesque incidents or romantic stories adorn Wollaston's biography, and but few characteristic anecdotes have been preserved. His days were spent with entire devotion to science, between his laboratory and his library. For it was little better than an extension of this, that he was a diligent attend-

ant on the meetings of the Royal, the Geological, and other societies, and took a keen interest in their proceedings. Occasional excursions to the country appear to have been his only recreation. These afforded him an opportunity of prosecuting geology, which was a favorite study, and, during the last twelve years of his life, enabled him to gratify the love for angling with which Sir H. Davy had infected him.

His reluctance, or rather positive refusal, to admit even friends to his laboratory has already been referred to. Plato is said to have written above the door of his study, "Let no one who is not a mathematician enter." Had Wollaston placed an inscription, or rather a proscription, above the door of his laboratory, it would have been still more brief and comprehensive. "Let no one enter." It is related that a gentleman of his acquaintance, having been left by the servant to ramble from one room to another till he should be ready to see him, penetrated into the laboratory. The doctor, on coming in, discovered the intrusion; but not suffering himself to express all he felt on the occasion, took his friend by the arm, and having led him to the most sacred spot in the room, said—"Mr. P., do you see that furnace?" "I do." "Then make a profound bow to it, for as this is the first time, it will also be the last time, of your seeing it."

This hermetically sealed laboratory is known to have been of small dimensions. It did not require to be large, for Wollaston's researches were systematically prosecuted on a scale of nearly microscopic minuteness. He was celebrated for the almost atomic quantities of matter on which he wrought to as much good purpose as other men on hundreds of grains. His demonstration of the identity of columbium and tantalum was founded upon the examination of a very few grains of two rare minerals. His detection of titanium in the iron slags was effected on equally small quantities.

Dr. Paris mentions, in his life of Davy, that a foreign philosopher once called upon Dr. Wollaston with letters of introduction, and expressed an anxious desire to see his laboratory. "Certainly," he replied; and immediately produced a small tray containing some glass tubes, a blow-pipe, two or three watch-glasses, a slip of platina, and a few test-tubes. It is added by the same gentleman, that Wollaston appeared to take great delight in showing by what small means he could produce great results. Shortly after he had inspected the grand galvanic battery constructed by Mr. Children, and had witnessed some of those brilliant phenomena of combustion which its powers produced, he accidentally met a brother chemist in the street. Seizing his button, (his constant habit when speaking on any subject of interest,) he led him into a secluded corner, when, taking from his waistcoat pocket a tailor's thimble, which contained a galvanic arrangement, and pouring into it the contents of a small vial, he instantly heated a platina wire to a white heat.

Wollaston was fond of amassing money: there have not, indeed, been wanting accusations to the effect, that if he had sought less after wealth, he would have done more for science. How far these charges are true, we have no means of judging, as it does not appear from the published accounts, in what exact way he made his money. That it was chiefly by the platina process is certain, but whether he engaged in the manufacture

himself, or only superintended it, we do not know. On this point we would only remark, that there is something, to say the least of it, very partial and unfair in the way in which obloquy is cast upon men of science, if they appropriate to themselves some of the wealth which their discoveries procure for others. If a successful naval or military hero is lavishly pensioned out of the public purse, no one complains. It is not thought strange that a great painter or sculptor, whilst he justly declares his productions are worth untold gold, should nevertheless demand a modicum of coin from his admirers. Neither is the poet or musician blamed who sells his works to the highest bidder. But if a chemist, for whom there are few pensions and no peerages, think to help out a scanty or insufficient income by manufacturing gunpowder like Davy, or magnesia like Henry, or malleable platina like Wollaston, or guano like Liebig, the detractors assail him at once. He has lowered the dignity of his science, and, it would seem, should starve, rather than degrade his vocation. That vocation, so far, at least, as the practical fruits of his own labors are concerned, is to be a kind of jackal, to start game which others are to follow, a beagle, to hunt down prey which others may devour. Surely there is but scanty justice here, and some forgetfulness of a sacred text, "Thou shalt not muzzle the mouth of the ox that treadeth out the corn."

We are no advocates of a sordid spirit in men of science, neither do we lament that government is less liberal to them in this than in other countries. When we look at the roll of our illustrious men, we see little reason to regret that they have not the grants which France, Germany, and Russia so freely bestow. Neither system is perfect, and our own, with all its faults, works well. But private enterprise must manifestly supplement the deficiencies of government aid. It is therefore unfair to blame an unpensioned, unplaced chemist like Wollaston, if he secure an income by his independent labor. To manufacture platina may be, in the eyes of the world, a less dignified occupation than practising medicine, but it left the man of science much more leisure for his studies than physic would have done, and paid him a great deal better.

We will not, however, take it on us to affirm that Wollaston might not have been content with less than 30,000*l.* Perhaps, and probably he might have been, though we know too little of his circumstances to be able to judge exactly on that point. That he did not selfishly hoard his money may be gathered from the following anecdote, which is declared to be authentic. Having been applied to by a gentleman, who was involved by unexpected difficulties, to procure him some government situation, Dr. Wollaston's reply was—"I have lived to sixty without asking a single favor from men in office, and it is not after that age that I shall be induced to do so, even were it to serve a brother. If the enclosed can be of use to you in your present difficulties, pray accept it, for it is much at your service." The enclosed was a cheque for ten thousand pounds.

In attempting further to illustrate Wollaston's character, we must have recourse to the device so common with biographers, of comparing him with some of those who were engaged in the same pursuits as himself. A natural and admirable occasion for doing so, such as Plutarch would have delighted in, is afforded by the fact that Wollaston



and Davy were contemporaries and friends. It is difficult to imagine a greater contrast than that between the eager, imaginative poet-chemist, on the one hand, and the austere, unimpassioned, monk-philosopher on the other. Davy was a man of sanguine, enthusiastic temperament, overflowing with life and animation; Wollaston's nature was as still and unmoved as the bosom of a lake hidden from the wind in the recesses of a cavern. The former was a spoiled child of nature and of fortune, and greedy of applause. He delighted in the approving smiles of ladies, and was flattered by the notice of the great. It was a source of pain to him that he was not of good family. Wollaston was a disappointed man. He begged one boon from his brethren, the physicianship of an hospital; when that was refused him, he shut himself up in his laboratory, and rejoiced, when sixty years old, that he would not ask a favor, even for a brother. He was indifferent to the notice of all but scientific persons, and avoided every occasion of attracting popular attention.

Their characters as philosophers were as different as their tastes and habits as men. Davy had far greater originating power, boldness of speculation, and faculty of generalization; and he showed great skill in realizing his ideas. Wollaston excelled Davy in extent of scientific accomplishment, in minute accuracy of observation, and in closeness of reasoning. He wrought out his conceptions with singular ingenuity, and brought the utmost mechanical experience and dexterity to the solution of difficult questions. Both were good artists and manipulators, but Wollaston was much the better of the two. Davy was very ingenious in devising, but reckless and inexperienced in constructing. Wollaston excelled him in ingenuity, and, moreover, was a first-rate workman.

The mode in which they reached their discoveries was as dissimilar as the subjects which they selected. Davy considered the faintest analogy worth pursuing. Possibilities were with him probabilities; probabilities truths. Wollaston's idea of a truth was not so much something proved true, but something which could not be proved not to be true. His most positive yes was often a *not* no, rather than a hearty yea and amen. When Davy took up an inquiry, it was with the highest hopes and visions of success. If he gained his end, he was greatly elated, if he failed, he was correspondingly depressed. Wollaston set about a scientific undertaking more as if it were a matter of duty, than an occupation which by its result could possibly give him pain or pleasure. His pulse probably never quickened or slackened a beat in consequence of success or failure. When Davy discovered potassium, his delight and agitation were so great, that he enrolled the fact in his note-book in an almost illegible scrawl. Wollaston would have written the announcement in his roughest hand. With Davy, the end of the inquiry was the great object; the shortest way by which it could be reached was the best. The means by which it was arrived at, were in themselves indifferent. He hastened impetuously to reach the goal. For Wollaston, the journey had interest, whatever might be its conclusion. He hated to make a false or doubtful move, though it might advance him towards his ultimate object. Each stage of the undertaking was, for the time, the entire subject of concern. He travelled leisurely along, breaking new ground with the utmost cau-

tion, fastidious about every step of the journey. A sufficient pathway would not content him, though no one might follow his steps. He must stop, and make it a perfect road. The one philosopher was like the stag-hound running down the game his keen eye got sight of, by speed of foot and nimbleness of limb, or missing it altogether. The other resembled the blood-hound following leisurely on the trail of his prey; slow, comparatively, in his movements, and with eyes fixed upon the ground, but certain never to quit the chase, or to make one false step till he was up with his victim. Davy's genius was like the burning thunderbolt whose forces he did so much to explain. Attracted only by towering and lofty things, it smote down from the zenith, prostrating maiden citadels, and scattering in dust, or dissipating in fiery drops, whatsoever opposed it. Wollaston's genius was like the light, whose laws he so much loved to study. It was not, however, the blazing light of day that it resembled, but the still moonlight, as ready with clear but cold radiance to shine in, on a solitary obscure chamber, as able to illuminate with its unburning beams, every dark and stately hall of the closed fortresses where Nature keeps her secrets.

In their habits of laboratory working and manipulation, Davy and Wollaston have been compared to the painters, Michael Angelo and Teniers; the former, reckless, impetuous, and turbulent in his mode of producing results; the latter, minute, microscopic, precise, and accurate, even in the smallest details. The comparison is just so far, but it either elevates Davy too high, or degrades Wollaston too low. Davy devising his safety lamp, after a few rapidly performed experiments, may be the Michael Angelo, contrasted with Wollaston, the Teniers, slowly perfecting a process for drawing out a capillary gold wire. But Wollaston, solving by means of a little telescope of his own adaptation, the problem of the existence of an atmosphere round the sun, contrasted with Davy discovering potassium by means of a gigantic voltaic battery, and every other aid and appliance to boot, must be called (as an artist friend suggests) at least a Correggio, whilst the latter is styled rather a Titian than a Michael Angelo. Davy and Wollaston were men of most marked individuality of character, and giants both. The youthful student will do well who accepts the guidance of either. He will do better, if like Faraday, he unite the excellences of both.

To these attempts to bring out Wollaston's character by contrasts with that of his great contemporary, we would add a word or two concerning his likeness in disposition to another of our distinguished men of science. Those who are acquainted with the life of the Honorable Henry Cavendish will acknowledge that he and Wollaston resembled each other greatly. In both there was the same austerity, taciturnity and reserve; the same extreme caution in drawing conclusions, and exact precision in stating them; the same catholicity of tastes as regarded their philosophical pursuits; the same relish for scientific society and dislike to any other; the same indifference to applause; the same frugal habits; the same candor and justice towards other men of science; and the same strong love of truth and perfect integrity. And as in life they were alike, so in death they were not divided. The closing moments of the one, were marked by the same kind of calm

courage and serenity which distinguished the death-bed of the other. Cavendish and Wollaston might in truth have been twin brothers.

In contrasting Wollaston with Davy, and in comparing him with Cavendish, we have not willingly overstated matters. But all such attempts partake more or less of rhetorical artifice, and convey at best but a partial and imperfect idea of the character of any individual. No man is exactly the opposite or exactly the image of another. If his name be worth preserving at all, his individuality must be marked, and should be susceptible of definition and demonstration. It seems to us that three predominant qualities determined the scope of Wollaston's genius. The statement of these will perhaps in some degree explain the comparatively slight impression which he has made on science, and the partial oblivion into which his name has already fallen.

We remark first, that, in common with all great observers in physics, he possessed a keen intellect, a well-balanced judgment, a most retentive memory, rapidity and readiness in discerning analogies, great power of analysis and also of generalization, perseverance in working out ideas once started, and practical skill in effecting their realization.

To hold in check these estimable qualities, there existed in the first place a quite inordinate caution, which never permitted them to range freely over the domains of science. Wollaston's caution was of a peculiar kind. It was not the wariness of timidity or self-distrust. He was in all respects a courageous man, and had much more self-reliance than Davy. The boldness of a speculation would not have deterred him from entertaining it. It would, in truth, have been neither a recommendation nor an objection to any suggestion. Fearlessness or timidity, as evinced in a hypothesis or theory, were qualities intangible to science, which was only concerned with the question, was the speculation true, or was it not?

It was untruth that Wollaston so greatly dreaded; and the fear of it made him prone to underestimate the positive worth of any fact. An inquiry thus became for him a very tedious and protracted affair. It was not sufficient that a fact, perhaps quite incidental to the main object, and what other men would have called trivial, was true enough for the use he had to make of it. It must be true enough for every purpose it could be applied to: in a word, positively and absolutely true. Wollaston was thus like a man crossing a river by casting in stepping-stones, but who would not be content, that, with here and there a pretty long leap, and now and then a plash and a wetting, he should get across. He must stop and square and set each stone, before he stepped on to the next, and so measure his way to the other side. Yet the stones were no more to him than to other travellers. To cross the river was his object as well as theirs. The stepping-stones were only the means to that. But they were doubtful and uncertain means, if carelessly arranged. Many would reach the opposite side in safety, but a single pilgrim might be washed away and drowned. Wollaston made a pathway safe even for the blind.

Davy, when he discovered potassium, argued somewhat thus: It is probable for several, or (as he would say) for many reasons, that potash and soda are the oxides of metals. It is also probable that electricity, which can decompose so many things, will be able to decompose them. He tried if it would, and discovered some dozen new metals.

Wollaston would have said, it is possible that the alkalis contain metals, and possible also that electricity could separate them. But at that point he would have stopped to array the probabilities against both ideas proving true; and these would have appeared so strong that he would never have gone further.

All discoverers, with the exception of the very highest, such as Newton, take a great deal for granted. They advance not by steps, but by strides, and often gain their ends in strange ways. The new country in which they land themselves and their brethren, is reached by some bold attempt which is soon stigmatized as illegitimate and unworthy. The new country, however, is there for all that, and more legitimate and worthy methods of approach are soon discovered. We have Liebig for example, in our own day, accused of assuming doctrines that he cannot prove; and of giving us hypotheses as thoroughly established generalizations. Now and then he is provoked to return some indignant rejoinder to the bitter denunciations of his angry critics. But they make no abiding impression on the eager German, who replies with fresh assumptions and new hypotheses, more aggravating than before. His successors will doubtless weed out of his system as useless many things which he counts as essential to it, and establish as only partially just much that he believes to be absolutely true. But if Liebig had stopped like Wollaston to render each step in his progress incontrovertible, organic chemistry would be infinitely less advanced than it is at the present day.

Had Wollaston been a man of as grand and as fine intellect as Newton, his caution would not have prevented him being a great discoverer; but with faculties much more limited than his, he had caution equally great. Accordingly, although he had the start of Davy in electricity, and knew that science thoroughly, he allowed the latter to carry off the greater number of the trophies in galvanic discovery. He detected for himself the law of combination in multiple proportion, and might have extended it into such a scheme as Dalton embodied in his atomic hypothesis. Wollaston was infinitely better qualified than Dalton to investigate by experiment, laws of combination. But he stopped with the discovery of the one law, and did not even publish that, till Dalton had made it known along with several others.

But characteristic as caution was of Wollaston, it may be questioned whether it was more strongly marked in him than in many other philosophers. Black, and still more Cavendish, were as cautious as he was. We must look farther, before we can sufficiently account for the apparently small amount of fruit which his life of scientific labor yielded.

We would indicate as the second feature in Wollaston's mind which prevented his effecting greater achievements, the versatility of his tastes. There was scarcely a science which he had not studied and was not competent to extend. His Cambridge education gave him a taste for mathematics and the mathematico-physical sciences. From his father he inherited a fondness for astronomy, and by him he was probably initiated into its mysteries from his earliest years. No man can be long an astronomer without feeling it necessary to study geology: Wollaston accordingly became a geologist. Neither will any one make use of telescopes without becoming anxious to understand and to improve their construction: all astronomers, accordingly,

are students of optics. Wollaston was a most diligent one. None of these sciences, however, will support their votaries: our philosopher accordingly studied medicine. This introduced him to anatomy, physiology, pathology, botany, and chemistry, on each of which he published papers.

Davy had a most imperfect acquaintance with all the sciences, except chemistry and electricity. Wollaston knew them all, and worked at them by turns. A list of some of his papers which we have not commented upon will show how impartially he distributed his attention. The Bakerian lecture for 1803: "Observations of the quantity of horizontal refraction; with a method of measuring the dip at sea."—The Bakerian lecture for 1806: "On the force of percussion." The Croonian lecture for 1810: "On muscular motion, sea-sickness, and carriage exercise." The Bakerian lecture for 1813: "On the elementary particles of certain crystals." "On a method of freezing at a distance." "On a method of drawing extremely fine wires." "On a periscopic camera obscura and microscope." "On a method of cutting rock crystal for micrometers." "On gouty concretions." "On the concentric adjustment of a triple-object glass," &c. &c. &c. The reader will add to these, those named or discussed in our article already.

Davy was obliged to confine himself to the two sciences he knew, and in consequence, greatly extended them. Wollaston had the "open sesame" to them all, and the result was, that he did a little for every one. He who divides his fortune into a number of small bequests, and leaves one to each of those who have a claim on him, is thanked for the time, but speedily forgotten. But when a man gives his all to a single great object, it embalms his memory. Wollaston has passed from men's notice. Davy is immortal.

There remains, however, a third characteristic to be noticed before we can understand all that biassed Wollaston, and turned his thoughts away from great scientific actions. We allude to his wonderful inventiveness and mechanical ingenuity. We call it wonderful, because, with the exception of James Watt, Hooke, and a very few others, Wollaston surpassed all his scientific countrymen in this respect, and there are not many foreign natural philosophers who could be placed above him. Without entering into any detailed proof of this, we only remind the reader that he was the inventor of the reflecting goniometer, the camera lucida, the dip sector, the cryophorus; of a micrometer, of various improvements on the microscope, on the common eye-glass, on the camera obscura, and of one most important one on the telescope; of the method of rendering platina malleable, of a method of drawing extremely fine wires, of a method of comparing the light of the sun with that of the fixed stars, and of many others which we cannot stop to mention. In addition to these special inventions, his papers are filled with descriptions of the most ingenious and original contrivances for securing the ends he had in view. When he became an angler, he astonished his friends by many curious devices for overcoming difficulties in the new art he had taken up.

It must have come within the observation of most persons, that very ingenious mechanical contrivers find the greatest pleasure in giving birth to inventions, and, where no other and higher taste divides their inclinations, and no pressing duty occupies their time, often devote themselves en-

tirely to the gratification of their talent. It is most natural that they should do so. There are few intellectual pleasures greater than that of being creators, even to the extent that man may be one. The feeling of exultation with which the poet, the painter, or the musician, rejoices over the offspring of his genius, is shared, though in a lower degree, by the inventor whose new instrument or method is as much a creation, the embodiment and monument of an idea or ideas, as the poem, or the picture, or the oratorio. In many men, ingenuity goes no further than devising. They are not craftsmen, to execute their plans; and to give them to workmen would involve too costly a gratification of their wishes. But Wollaston was an excellent workman; his hand was as ready to construct as his brain to invent; and they went together. There was thus a twofold temptation to gratify his inventive powers; and he did gratify them to the utmost: but time so spent was often little better than thrown away. We rejoice that he invented a reflecting goniometer, and supplied an achromatic object glass for the telescope, and we do not grudge the camera lucida; but as for the not very important improvement of spectacles, microscopes, and camera obscura, they might have safely been left to be made by a duller man, when it appeared they were wanted. It was putting Pegasus in the yoke, or setting Samson to grind at the mill, to waste Wollaston's energies on such work. His case should be a warning to young scientific men who have a great mechanical turn, to take care that it does not warp them aside from higher objects, and convert them into mere instrument-makers. When we think how many inventions are only works of supererogation, no better than Rob Roy's self-acting pistol, which was to protect the entrance into a leather purse; or useless toys, like the recent Eureka machine, for making nonsense Latin hexameters, or of the most circumscribed application, like patent needle-threaders: we cannot but wish that each inventor would pause, and ask whether there is, or will be any need or demand for what he is about to devise, before he proceeds to execute his project. Many of Wollaston's inventions are now forgotten or superseded.

The restraint and distraction of faculty which these three influences occasioned, were fatal to Wollaston's being a distinguished or systematic discoverer. His inordinate intellectual caution kept him from giving to the world any great generalization. Had he attempted one, he would have spent a lifetime in establishing it to his own satisfaction. His acquaintance with most of the physical sciences induced him, instead of dedicating his life to the establishment of some one great theory in a single branch of knowledge, to pursue many inquiries in each; these were sufficiently limited in scope to be brought to a conclusion, satisfactory even to his fastidious, skeptical spirit, in a reasonable time. His mechanical ingenuity constantly tempted him to improve some one of the thousand instruments of physical science which are not perfect.

He must nevertheless be counted great, on the ground of the multitude of single works which he executed so ably. He will stand in the second rank of great physical philosophers, along with Black and Cavendish, Davy and Dalton.

The portraits of Wollaston represent him as a grave, silent, meditative man: one who would excite much sincere respect, but little enthusiastic affection, among those who knew him. He led a solitary life, and was never married.



His senses were peculiarly acute, a valuable possession to a physical philosopher. Some, indeed, have dwelt upon the acuteness of Wollaston's senses as the source of his greatness as an inventor and discoverer. Others have indignantly affirmed that it was wronging a great philosopher to ascribe his triumphs over nature, merely to his having had a sharp eye and nimble fingers. The dispute seems a needless and a foolish one. That Wollaston had very acute bodily senses, has been certified to us by himself, and by those who were his associates. But if any one think that the mere possession of these will make a man a Wollaston, let him only consider that there is not a Red Indian or an Esquimaux who can distinguish a white hare from the white snow around it, who does not at least equal, if not far surpass, the philosopher in acuteness of bodily senses.

On the other hand, it would be in the highest degree unwise to despise the gifts of sensitive bodily organs, and to leave out of consideration the influence of the physical element in determining the character of men. Soul and body must be present in certain though varying proportions, to suit us for our special vocations; and the elements must be as kindly, though differently mixed, to give the world assurance of a physical philosopher as of a poet or a statesman. Wollaston, like most of his distinguished fellow-men, owed a great deal to his body, but a great deal more to his soul.

From what has been already stated, it will be manifest that our philosopher was not what most people would term an amiable person. He was, however, a just and most honorable man; candid, open, and free from envy. Of this, many proofs might be given. We have already seen that he freely lent his influence to secure Sir H. Davy the chair of the Royal Society. His papers, also, afford incidentally many evidences of his candor. In the one on the finite extent of the atmosphere, he mentions, that after making his own observations on the transit of Venus over the sun's disc, he discovered that results equally accurate had already been obtained by M. Vidal of Montpellier, to whom, accordingly, he assigns the priority. In his essay on the forms of the elementary particles of certain crystals, he points out that he had been anticipated by Dr. Hooke. He states, as a reason for publishing his paper on super and sub-acid salts, that he wished to furnish Dr. Dalton with a better means of proving the truth of his doctrine of combination in multiple proportions than the latter's analysis of certain gases had supplied. He had occasion to point out that the chemist Chenevix had committed a great blunder in reference to the properties of the metal palladium: he did it in the most delicate and courteous way.

Altogether, the combination of reserve with perfect straight-forwardness; the relish for acquiring money, with the generosity in parting with it when it could be worthily bestowed; the clear intellect, the self-reliance, the aversion to interference or intrusion on the part of strangers; the impartial justice to rivals, and the business-like method of all his habits, seem to us preëminently to mark out Wollaston as, *par excellence*, The English Philosopher.

#### BUCKINGHAM PALACE.

THE London Times, in the following article, seems disposed to treat with levity the complaint of

insufficient accommodations for Queen Victoria, and her increasing family at her metropolitan residence.

"There appeared in our paper of Thursday a report on the misery and inconvenience to which the queen and her family have long been exposed by the want of adequate accommodation in Buckingham palace, and the subject also attracted not a little attention in the House of Commons last evening. This unlucky palace appears to be as comfortless within as unsightly without, and proves to be as little adapted for use as for ornament. The report to which we have referred reminds us of those distressing documents of the health of towns commissioners, in which the miserable condition of the poor, and the sufferings occasioned by the overcrowded state of their dwellings, are described. That the sovereign has been subjected in her own palace to all the horrors that affect the health of towns is really dreadful to think upon. It is impossible for a loyal man to read the statement of Mr. Blore, the architect appointed by the commissioners of woods and forests, without shuddering at the over-population, the bad ventilation, the want of air and space, which he describes with a most pictorial pen to have prevailed for some time past in Buckingham palace. He divides the royal discomforts under seven different heads, every one of which is sufficient to mar very materially the domestic enjoyment of her majesty.

"In the first place, the private apartments of the queen and the prince in the north wing 'were not calculated originally for a married sovereign.'—What could the architect have been about when he designed to accommodate the occupant of the throne in 'lodgings for a single man,' or a single woman? What right had he to presume on the celibacy of the wearer of the crown, and provide apartments not fitted, according to Mr. Blore's report, for the accommodation of 'the head of a family?' What is enough for one is very often not enough for two; and we can sympathize with the royal pair, who have been 'managing' for the last few years in a small suite of rooms only designed for an unmarried lady or gentleman. In addition, however, to the insufficiency of space, it appears that the queen and the prince have been undergoing the further infliction of living over a workshop. The lord chamberlain, it seems, has his smith and upholstery establishment, where he is constantly boiling his glue and carrying on other offensive operations immediately under the private apartments of the sovereign. A three pair attic could scarcely be worse situated as to smell and noise than the rooms occupied in Buckingham palace by her majesty and her illustrious consort. Our loyal blood boils almost as violently as the glue at the contemplation of the fact that the queen and the prince have been residing all these years over a workshop in Pimlico. We have no patience with Mr. Blore's calmness when he talks of the 'obvious impropriety' of the 'arrangement.' He, however, warms up a little under the recollection of the great truth, which he lays down with considerable force and distinctness, that oil and glue are 'both of them inflammable substances.' He hints at the risk of fire, and suggests to the minds of her subjects the alarming reflection that the sovereign and her husband have been occupying a building which the insurance companies would consider doubly or trebly hazardous.

"The second grievance brings us to the distressingly contracted state of the royal nursery. Mr. Blore begins by calling public attention to the prob-

ability of the royal infants increasing in their growth—an extension to which they are undoubtedly liable. Happily, there is, we believe, no tendency among her majesty's children to Tom Thumbism, and Mr. Blore's suggestion that they will grow is extremely rational. It seems that 'a few rooms in the attics of the north wing' are all the nursery accommodation available 'to meet the growing wants of an increasing family.' The rapid succession of 'happy events' must, of course, have materially added to the inconvenience existing in this particular portion of the palace. Some of the servants have accordingly been dislodged from their attics and packed in small compartments on the ground floor, where one room has been cut down into two 'by the assistance of a false ceiling.' This shocking but ingenious contrivance reminds us of the system of stowing away the blacks in slave vessels. If any of the tall footmen happen to have undergone this compression into an apartment half its ordinary height, they must have been literally doubled up by the dreadful process. They must have found it necessary to learn the art of shutting themselves up and drawing themselves out again on a kind of telescopic principle; for, though they would be forced to shrink into littleness when they retired to their own rooms, they would be expected to stand erect in the presence of their sovereign.

"The third grievance relates to the want of accommodation for the lord chamberlain, who, notwithstanding that he is perpetually hammering and boiling glue under her majesty's private rooms, has not sufficient scope for his extensive operations. We were not aware that the lord chamberlain's department included so much carpenter's business in ordinary and smith's work in general. The ignorant in these matters might imagine that the work-shop so near the person of the sovereign may have something to do with the making or repairing of the cabinet. It seems, however, that so extensive is the business of the lord chamberlain in the upholstery line that he keeps up branch concerns in St. James' palace and in 'still more remote quarters.' Where can these 'quarters' be that are even more 'remote' than St. James' palace? By the disinclination shown by Mr. Blore to furnish the address, we should be disposed to guess that the chamberlain has got a shop in some such place as Whetstone park, or down a mews in some equally recondite neighborhood.

"The culinary department is the next to which the report refers, in language so strong as to declare, that, 'the kitchen has defeated every attempt to prevent its being a nuisance to the palace.' The obstinacy of the *cuisine*, which has triumphed over every attempt to keep it down, must have been indeed remarkable. We presume that odors of stews and hashes were the weapons by which the defeat alluded to has been accomplished. The kitchen must have carried its sauce to a fearful height thus to have flown into the very face of the sovereign. While, however, it has been strong as a nuisance it has been impotent as a minister to the hospitality of the queen, and it is proposed, therefore, to add to the efficiency of what Mr. Blore justly calls these 'essential offices.' It is also suggested that a new room should be built for balls and entertainments, from which we are given to understand many have been excluded simply on account of the want of accommodation. This hint will be balm to Lord Brougham and others who may have been wondering that they were never asked to dine or dance at the palace. Perhaps the

passage may be intended to give to many 'a sop in the pan,' as a substitute for the cover they have not been permitted to enjoy at the royal table.

"The reception of illustrious guests is another most important matter referred to in the report, which tells us there is but one suite of apartments that her majesty can offer to distinguished visitors. Thus it happens that if two great potentates should arrive in England at the same time on a visit to the queen, as their majesties of Russia and Saxony did, there is only a spare bed for one of them. It is true, as the report states, that at great inconvenience apartments could be 'diverted from their ordinary appropriations,' or, in other words, the King of Saxony might have been asked to sleep on a sofa while the Emperor of Russia was in the house; but this is not the way in which the Queen of England should receive the monarchs of Europe. After an allusion to the over-crowding and ill ventilation of the palace generally, by a great number of persons being crammed into small rooms, the report concludes by promising to suggest a remedy.

"In this, we fear, even the fluent Mr. Blore, backed though he be by ministers and ex-ministers, will find himself at fault. If all the allegations he has so laboriously set forth are true, we see no other course than to clear away the structure that now stands, and to build a new one on the same site, if it is thought desirable to keep the royal family still located in the middle of a swamp at Pimlico. The Pavilion at Brighton is, it seems, to be sold, pulled down, and carted away as dry rubbish, and it would, we think, be as well to dispose of Buckingham palace in the same manner. It is already more than ugly enough, and will be uglier still when a kitchen is added in one corner, a nursery stuck up somewhere else, and a ball or banquet room built out in some other direction. We ought not to forget that the report alludes to very considerable accommodation being required for the tutors who will soon have to be in attendance on the royal family. The proposed wing for these gentlemen must, of course, therefore, be considered in the architectural design, which cannot, we think, have a fair chance unless it is wholly unfettered by any reference to the present structure."

From the Pittsburgh American.

DANIEL BOONE.

IN the last June No. of Littell's Living Age is an article credited to Chambers' Journal, professing to be a condensation of a sketch of the life of Col. Boone, from the January No. of the North American Review. In the article before us we find it stated that Daniel Boone "was born in the county of Somerset, England." This is a very great error, and we are surprised that journals of such high reputation should commit so gross a one. In the present instance it is absolutely too bad. English writers are fond of claiming Washington as their countryman, because he was born of the descendants of Englishmen and under English rule. They have the same, but no other claim for their country, to the honor of giving birth to Daniel Boone.

The great men of a country are its most estimable and cherished property, and the honor of giving birth to such, should be maintained with as much tenacity as the purity of their fair fame and the truth of their great actions. Among the distinguished men of America, Daniel Boone will ever hold an enviable rank.

We happen to know something of this matter, and shall endeavor, so far as it lies in our power, to set these reviewers right where they are found so widely astray.

The following facts in relation to Daniel Boone and his family, we have, partly from tradition and partly from records now in our possession, obtained from an aged member of the family, long and intimately known to us.

George Boone and Mary his wife arrived at Philadelphia, October 10, A. D. 1717, N. S., from Bradninch—within 8 miles (as we learn by another record) of the city of Exeter, in Devonshire, England. They brought with them, as our tradition states, 11 children—two daughters and nine sons. We have direct intelligence only of three of these sons—John, James, and Squire, and record of the births, marriages and deaths of the two first. The last, Squire Boone, was the father of Daniel Boone.

George Boone, immediately after his arrival in America, purchased a large tract of land in what is now Berks county, which he settled, and called it Exeter, after the city near which he was born. The records distinguish it only as the township of Exeter, without any county. He purchased also various other tracts in Maryland and Virginia, and our tradition says, among others, the ground on which Georgetown, D. C., now stands, and that he laid the town out, and gave it his own name.

His sons John and James lived and died on the Exeter purchase. Squire removed into North Carolina, but at what period we only know from the traditionary account we received, that it took place when Daniel was in his 14th year.

In 1790, or about that period, Daniel Boone revisited the place of his birth and the friends and relations he had left, and from these we have verbal accounts which he gave them of his adventures in Kentucky, which are preserved in the family with affectionate and pious care. Among these relatives are the Leas, still residing in Oley, Berks county. It would, therefore, require no great research to find almost the very spot of his birth. We show sufficiently, however, that neither he nor his ancestors came from Somerset as stated, but the latter from Devonshire, and that he himself was born, not in England at all, but in Exeter, Pennsylvania, in what is now Berks county, and in that part of Berks too, be it remembered, called Oley, about which we have before said or sung much that was good.

Flint, who says in his life of Boone, that "the remotest of his ancestors of whom there is any recorded notice, is Joshua Boone, an English Catholic, who settled in Maryland," wrote, in this instance, at least, in entire ignorance of his subject. Joshua was a family name among the Boones, and may no doubt have been the name of one of George and Mary Boone's nine sons, but George Boone was not a Catholic, but a member of the English Protestant church. This fact we have from the same source of tradition with other facts here given. We have also a certificate in our possession of the marriage of James Boone, a grandson of George and Mary, which took place in the English Protestant church at Reading, Pa. Also the record of the death of Judah Boone, another grandson, which adds that he was interred in the Friends' burying ground at Exeter. This goes to confirm another of our traditionary accounts, which informs us that several of the family, after their settlement in Pennsylvania, joined the Quakers.

Flint has other gross errors. He says he was born in 1746—that he died in 1818—aged 84. This

would make him but 72. Our family account places his birth in 1730 or '31.

We learn another matter from these records—that the name is uniformly spelt as we have given it in this article, with the final *e*.

A CORRESPONDENT calls our attention to an historical point disputed between Lord Brougham and Lord John Russell. The great promoter of useful knowledge thought that he had detected Lord John in a blunder, because the premier calls Mr. Wilderspin the "founder" of infant schools: Lord Brougham says that Robert Owen was the founder; and Lord Lansdowne, the premier's colleague, rather inconsiderately accepts the correction. It is itself an error.

"In his haste to convict Lord John of an historical error," says our correspondent, "Lord Brougham has certainly committed a greater injustice, in depriving Wilderspin of the credit to which he is justly entitled. As far as I can ascertain, the facts were these.

"Oberlin collected young children into large rooms, and by means of women called 'conductresses,' taught them to read, to sing, and amused them with pictures. Robert Owen's primary object appears to have been to keep the young children out of mischief while their parents were at work: they went through some bodily exercises, including measured dancing to a fiddle, and probably some instruction was given them also.

"The establishments in London were of the nature of *asylums* for children of the very lowest class, varying from two to eleven years of age. Wilderspin, whose thoughts had previously been directed to the instruction of the young, took charge of the second of these establishments; and it was here that he developed, little by little, as circumstances required or experience suggested, the system of *infant training*, of which he is the author. In his own words, (*Early Discipline*, p. 9,) 'Every week and day and hour had, in fact, directed our attention to something new; and thus one invention or application followed another, until the whole Infant System, as it now appears, was evolved.'

"It is of very little consequence who first collected infants together into a school; but it was Wilderspin who originated the infant system of training, now in its main features universally adopted in infant schools—which gives them life and power for good; and consequently Wilderspin made or founded infant schools *as they are*. This is the real point of consequence. I fear I have expressed myself very badly; but I think you will perceive the distinction I wish to establish between infant schools *in name* and infant training schools *in reality*."

Lord Brougham's counter mistake lay in supposing that Owen's "Infant School" and Wilderspin's "Infant School" were the same thing: Owen's being a superior kind of custody in a nursery; Wilderspin's a real school, which he had most ingeniously discovered the means of adapting to infant understanding. Owen founded one thing, no doubt; Wilderspin another. The learned lord, however, admits Mr. Wilderspin's merits as a promoter of infant training: Lord Brougham knows from personal experience how delightful, after a life of unremitting energy, is a retiring allowance—he has studied the subject: it would be graceful in him to back his acknowledgment of a fellow laborer in the cause of education by lending his help to the Wilderspin Testimonial.—*Spectator*.



From Chambers' Journal.

## CARDS, LETTER ENVELOPES, ETC.

"WHERE to, sir!" said the cabman, touching his hat, and leaning from the box. "Bunhill Row." In a moment I was off, and very speedily found myself hurrying through Clerkenwell, towards that curious and classic labyrinth of streets composing the north-east division of the metropolis. The difficulties of Chiswell Street and Barbican were passed, and I was set down at a port-cocher, the limit of my excursion, as the good early hour of eleven sounded from St. Paul's.

It was a visit of curiosity. I wished to see one of the most remarkable establishments in London—an establishment which could only flourish in the midst of a great and wealthy people—De la Rue and Company's manufactory of fancy stationery. The art of writing letters is pretty nearly as old as the hills; but, till within the last twenty years, there was no such thing as a tastefully-got-up epistle. There was a deficiency in the *mécanique* of letter-writing. In Norway, at the present day, when a person wishes to write a note, he cuts a piece from a large sheet of paper; and something of this sort was prevalent in England forty or fifty years ago. It was considered a great advance in taste when a paper-maker at Bath got up what he called his "Bath post"—a smooth yellow paper, quarto size, with a small stamp in the corner of the sheet. Matters remained at this point till a comparatively recent period, when the whole business of the stationer underwent a rapid and most extraordinary change—the establishment of the penny post alone causing the introduction of many new auxiliaries to epistolary correspondence. It cannot but be interesting to know who has led this great movement—who has filled the ladies' writing-cases with finely-tinted note papers—who has given to the world the envelope, the enamelled calling-card, and the numerous other elegancies which now fill the shop-window of the stationer. Different active spirits have contributed their respective inventions in this useful department of art, but the master-mind has been that of Thomas De la Rue. Mr. De la Rue is a native of Guernsey, and was bred to the business of a printer. He afterwards abandoned this profession, and was engaged for a number of years in London as a manufacturer of straw-hats. In consequence of the successive changes in fashion, which ended in the general disuse of straw for bonnets, this ingenious person was several times ruined; but, possessing a boundless buoyancy of temperament, and with inexhaustible inventive faculties, he always alighted on some fresh novelty, and recovered his former position. Finally, driven from straw, he fell upon the idea of making bonnets of embossed paper. This was a great hit; but ladies soon discarded paper hats, and Mr. De la Rue, forever abandoning bonnets, took up the card and paper trade. He had now a wide field before him, and, in the preparation of various little articles, excited and cultivated the public taste. At the end of twenty years, we find him the elder member of a company, with which are associated two of his sons. What was once a small and obscure concern, is now the largest of the kind in the world.

Entering by the large gateway of this interesting establishment, I was by the kindness of one of the partners, conducted over the several departments of the works—the whole nestling in a cluster of old edifices, and forming an amusing hive of industry; steam-engines, machinery, and animated beings,

commingling in restless and varied movement. The purpose of nearly all that strikes the eye, is to cause paper to assume new forms and appearances. Of this article forty-five thousand reams, valued at £30,000, are consumed annually—a quantity so great, that it would require three mills for its production. Of the other articles used, such as colors, oils, varnishes, leather, and gold and silver leaf, the value may be set down at from £10,000 to £12,000. I hope it is not trespassing on confidence likewise to mention that even the money paid for gas amounts to £400, and for coal £600 per annum. The coal is employed principally in furnaces for the steam-engines, of which there are two, one of eight, and the other of fifteen horse-power. With steam-pipes from the furnaces, the whole establishment is safely and economically heated. It will perhaps afford still more impressive considerations of the completeness of the arrangements, when I observe that the first place into which I was conducted was a large apartment devoted exclusively to the making and mending of machines. Here, at massive iron planing tables, and turning apparatus, I found five or six engineers busy at work, preparing lately-invented machines of different kinds. Mr. Warren De la Rue, by whom some of the most ingenious machines have been constructed, superintends this and other mechanical departments. This young gentleman mentioned to me that they could not possibly conduct their business with satisfaction and profit, unless they had always ready at hand the means of repairing and making machinery; the time lost and trouble expended in getting this species of work done out of the house would be tormenting and ruinous.

Adjoining this department is a mill-like apparatus for grinding colors, and materials for enamelling; and further on, in two upper apartments, is a laboratory, with retorts, mixtures, and a store of bottles sufficient to set up a chemist's shop: here is also a chemical library of French and English books, which are in constant requisition. It is deemed somewhat of a favor to be admitted to this department; for many projects for executing new and peculiar tints and surfaces, likewise processes for electrotyping, not generally known, are here daily in operation. The electrotyping, which is carried on by means of large troughs full of the appropriate liquids, is employed to multiply casts of any engraved or otherwise figured surface. Mr. De la Rue has carried his ingenuity so far in this branch of art as to produce an electrotpe plate, in copper, from the finest lace, and has hence been able to impart the effect of lace to printing in colors. How curious that a piece of delicate tissue, taken from a lady's cap, can, by means of troughs, acids, and other materials, along with electric action, be made to produce a solid plate of copper from which the pattern of the original can with facility be printed! Instead of using wax for taking moulds, *gutta percha*, a newly-discovered substance from Borneo, has here lately been introduced. It partakes principally of the nature of caoutchouc; but with this is combined a certain farinaceous quality, and it therefore retains impressions better than preparations of India-rubber.

By the electrotyping process, a very small piece of engraving can be multiplied to any extent; and therefore, supposing we wish the surface of a sheet of paper to be printed all over with a continually-repeated pattern—for example, the patterns on the backs of playing-cards—we need only engrave a single square inch: having got the electrotpe rep-

ditions of the original, they are all soldered together, and the sheet of printing surface is formed. Of what immense value to the arts is this discovery, any one can form an opinion. Mr. De la Rue, however, is prouder of his wire-cloth inventions than of any improvements he may have introduced into the process of electrotyping. In order to produce printing in colors, like the checks of a tartan, or any other diversity of lines, he has succeeded in forming, by means of the Jacquard loom, a cloth of brass wires, each wire being a type so to speak; and the cloth being fixed on a block, it gives an impression of great clearness and beauty. The cross-lined colored papers which one sometimes sees in the fly-leaves of books, and on the backs of cards, are effected by this ingenious application.

So far I have spoken only of things of a preparatory nature, and yet the list is not half exhausted. Above the electrotyping room is one occupied with die-sinkers and engravers—men busy with hammers, punches, and chisels, executing objects to be employed in some of the more elegant kinds of printing. Besides these artists, many individuals, I was told, were employed out of doors in designing patterns. On this branch, indeed, some of the best artists in London are occasionally engaged. Novelty and taste are never for a moment neglected. Mr. De la Rue mentioned to me that he sometimes gives as much as £20 or £30 for the drawing of a design not larger than your hand. The best classic models of antiquity are sought out, and so likewise have there been procured some of the most tasteful designs after Saracenic originals. Perfect novelty, however, is a governing principle. The object of the concern is to maintain a high character for originality—to copy from no one, English or continental. Formerly, in England, few or no manufacturers thought of going to the expense of employing designers, and consequently designers did not exist amongst us. In the chief manufacturing towns there might have been here and there a dissipated man of genius, who, when he could be laid hold of quite sober, would, for a guinea or so, furnish a design, such as it was; but there was no principle in the thing, and almost every manufacturer copied from French originals; the more enterprising among them bribing French workmen to send early copies of what they had begun to execute. The necessity for competing with continental manufacturers in the home market, consequent on the late free-trade measures, has, among respectable men, put an end to this meagre and shabby state of affairs. Every respectable tradesman, who desires to avoid following among the mere herd of imitators, not only employs skilled designers, but is constantly racking his brains how he is to maintain his place in the market. It sounded new to me, in general principles of trade, to be told that no man can now expect great success in any fancy manufacture *unless he competes with himself*. Competition with others won't do any longer. The true art consists in not waiting to be stimulated by rivalry, but in bringing out fresh novelties at proper times, one after the other, and so gaining a command, as it were, over the public taste. I was taken with this idea of Mr. De la Rue; it showed him to be a master in his craft.

Having been conducted through the preparatory departments of the establishment, I was now introduced to what forms a principal branch of manufacture. This is the making of playing-cards, which engages a considerable number of hands, and several machines and presses. The figures on playing-

cards are among the earliest things mentioned in the history of printing; and there they are, with scarcely any alteration, till the present day. While the figures, however, remain pretty much what they were, there has been a great advance in the mode of manufacture, and also in the quality of the card. Formerly, the figures were stencilled in water-colors; and some makers, it is believed, still continue this clumsy process. Mr. De la Rue, some years ago, introduced the improved plan of printing the cards with inks, or colors in oil, by which means no degree of rubbing or moisture of the hand can move the figures. At one time, playing-cards were plain on the back; now, they have generally backs printed with fanciful figures; and therefore each side of the card requires its own appropriate printing. Let me first speak of the face. A sheet of paper, containing forty cards, is printed at once. If the card have figures of only one color—as, for instance, all spades, which are black; or all hearts, which are red—then one impression is sufficient. But if there be several colors, as in the case of the honors, each has a separate impression from a differently engraved block; the last impression completing the figure. In executing a knave of clubs, for example, they first print his eyes, and other parts about him which are blue; an impression from a second block fills in the reds; a third imparts the yellows; a fourth the flesh color of the face; and a fifth gives the blacks. Each court-card, therefore, requires to go through the press five times; but, to save trouble, a large quantity of one color are executed at a time. Sheets for the backs of the cards are printed in a similar manner, but on paper which has been tinted in making.

The printing of playing-cards, numerous as are the impressions they must undergo, is but a small part of the manufacture. Having seen the printed sheets carried away to the drying-room, we proceeded to the pasting process. This was a greater novelty to me than printing. I was first taken into a side-room, where were several women mingling together sheets of paper of different qualities, according to certain prescribed arrangements. When a pile of sheets was completed, it was carried away to the pasting-room. Here there were two long tables, with a number of men at work. Each of these had on his left a pile of the mingled sheets, and on his right a tub of paste. Lifting a sheet with his left hand, and laying it on the bench before him, he speedily smeared it over with the great paste-brush he held in his right; next were laid down two sheets, only the uppermost of which was pasted; and thus there arose a great pile of pasted sheets, with unpasted intervals. The whole operation was performed in a rapid and business-like way, with all the regularity of a machine. The brush, which seemed to be made of soft bristles, was as large as the besom of a housemaid, but without any handle; and I was assured that so methodic do the men become in their movements, that the brush in each case performs precisely the same curvilinear evolutions. In this manner, from year's end to year's end, do these men work away with their great broad pasting-brushes, constructing the internal part of playing-cards. Coarse as this branch of labor appears, it is reckoned one of skill, and is accordingly well paid. The weekly wage of a good paster is about two pounds; some can realize as much as fifty shillings. The making of the paste is a separate branch; men being constantly employed in an adjoining room, over huge cauldrons, preparing this material, which chiefly

consists of fine flour; but a substance like whiting is also infused, in order to give solidity to the card. The quantity of flour consumed annually is four hundred sacks, from which two hundred gallons of paste are prepared and used daily.

The pile of sheets, while dripping wet, being taken from the paster, is placed in a hydraulic press, and being there subjected to a hard pressure, the sheets become well squeezed together. A long row of hydraulics stands behind the pasters for this purpose. The sheets are afterwards separated into boards, and hung up to dry. The pasting of the figured sheets to the front and back of the board is a final operation; and when this is done, every board consists of forty cards. There is yet, however, much to be effected in the way of drying, smoothing, and cutting. The drying-room is an extensive series of vaults, to which I was let down by an apparatus called a *lift*. The moist boards being dropped down in large quantities by this machine, are hung on poles, and dried by the heat of five hundred feet of iron pipes, through which steam from the engine is blown. To ventilate and remove the moisture from the vaults, a fan is kept constantly rotating and propelling air at the rate of 2000 cubic feet per minute. Having undergone a due baking in this warm and airy oven, the boards are lifted to a second floor, to which we shall follow them.

The second floor exhibits a busy scene of rolling and other apparatus, with great quantities of paste-boards and sheets in different stages of advancement. When a card-board reaches this department, it is for the purpose of being rendered perfectly smooth on the surface. Some persons would think that this end could be best effected by at once passing the boards under the severe pressure of metal rollers. This is a natural, but erroneous idea. On looking with a microscope at the surface of a card-board just come from the drying-room, it is found to consist of a series of small protuberances or hillocks. Now, if these were at once flattened by rollers or other means, the tops of the hillocks would be crushed down partly over the intermediate valleys, leaving minute portions of the valleys uncrushed; consequently, in shuffling cards, one would, to a certain extent, catch on another. To avert this, the card-boards are, in the first place, burnished all over with a rapidly-revolving brush, which searches into every hollow, and sweeps away any loose particles of matter. The next step is to level both sides by rollers; but here, again, a remarkable principle in mechanics is observable. Two surfaces smoothed in the same manner will not glide over each other so well as if they be smoothed differently. In smoothing the card-board, therefore, it is passed between two rollers, the lower of which is of metal, and the upper of paper; both are equally smooth, but they impart a certain variety in the dressing, to cause a sufficiently easy gliding of the cards, face and back. The paper roller is prepared in a way which no one could expect. A great pile of sheets being pasted together, squeezed to the hardest possible consistency, and dried, the mass is fixed on a spindle, and turned on a turning-lathe; the result is a smooth, round beam, the surface of which consists entirely of edges of paper, but the whole of as close a texture as a piece of finely-polished wood.

The operation of finishing is not yet by any means over. After being taken from the smoothing rollers, the boards are transferred to an apparatus for giving them a wash of certain kinds of

liquid, the object of which is to harden them, and render them impervious to the moisture of the hand. Following the principle already alluded to, the wash, which has a glazing effect, is of a different kind on the two sides, although to the naked eye the gloss is the same on both. These washes being dried, the card-boards are placed between sheets of brass, and passed, a few at a time, between millings-rollers. They are now carried to a hydraulic press for flattening; and here, having been subjected to a pressure of a thousand tons, they are taken out in the hard, flat, glossy condition in which they come under the eye of the public.

Removed from the pressing-room, the boards next migrate to the cutting apparatus. With this machine a man cuts them, individually, first into long slips, and next across into single cards. With such accuracy is this operation performed, that although the cutter turns out 20,000 cards in a day, all are precisely the same dimensions. The sorting into qualities next takes place, and requires much sharpness of hand and eye. Inspected minutely as they pass through the hand, they are thrown into three heaps, from one of which are made up packs called Moguls; from the second are made up Harrys; and from the third Highlanders. The Mogul cards are of prime quality and highest price; they have no speck or flaw on either back or face. The Harrys have each a single speck on the back or face; and the Highlanders have one or more specks on both sides. Why the portraits of the Great Mogul, Henry VIII., and that of a Highlander, should have been adopted as a cognizance on packs of playing-cards, I have not heard explained.

To complete the history of the manufacture, I might say something of the wrapping-up, the paying for engraved aces of spades to government, and the exportation of untaxed packs; but all this may be left to the imagination; and it is enough to say, that of one kind or other, the concern I am speaking of makes and sells a hundred thousand packs annually. The quantity of cards paying duty issued by the different makers is, I believe, about two hundred thousand packs in the year, besides which, probably double the quantity are made and exported duty free. The consumption of playing-cards in the United Kingdom is, to all appearance, stationary, notwithstanding the continual increase of population; it would, however, be rash to ascribe this altogether to a gradual diminution of card-playing propensities. It is believed that there is a prodigious sale of cards with surreptitious stamps; and it is Mr. De la Rue's opinion, founded on a knowledge of the trade, that, were the duty reduced from a shilling to threepence per pack, the government would derive ten times the amount of revenue from this branch of manufacture.

At one time Russia was one of the best customers in Europe for playing-cards; but this trade is now at an end, in consequence of that country having engaged in the manufacture itself; nor, judging from the quantity it makes away with, does this step seem unreasonable. In Russia, card-playing is a universal amusement, and will in all probability continue to be so while the people remain illiterate, and political speculation is attended with danger. To supply the demand for cards, the government took the fabrication of the article into its own hands, and with much liberality not only purchased from Mr. De la Rue a knowledge of the manufacture, but induced his brother to take the entire charge of the establishment in which the



cards are made. The quantity of cards thus made annually for Russian consumption is a million of packs, the profits on the sale of which are devoted to charitable purposes.

Hitherto I have spoken only of the manufacture of playing-cards, but it will be understood that visiting and other kinds of cards are made much in the same manner. Of all the varieties of cards which exist, playing-cards were the original type. Forty or fifty years ago, the only blank cards in use were the parings or other waste of cards for playing, and it was on trimmed morsels of this waste that visitors were in the habit of inscribing their names when they made a call. The fashion of leaving cards having at length established itself among our national customs, small blank cards of a superior kind were made on purpose, and now we find every variety which can be desired. Latterly, enamelled cards have been in vogue, and the making of these has become an important branch of Mr. De la Rue's manufacture. So, likewise, has the making of railway tickets of late assumed a more than ordinary importance. Nearly all the railways in the United Kingdom procure their tickets from this establishment, each having its own pattern as respects color and device. The card-boards for these tickets are cut by boys with such rapidity, that the eye can scarcely follow their movements. The aggregate quantity of tickets produced by the establishment is at present a million and a half weekly.

From the card-making department I was led into that which is devoted to the preparing of post-office and other envelopes; but I must postpone what I have to say on that interesting branch till another occasion.

On being conducted into that department of Mr. De la Rue's establishment which is devoted to the making of post-office envelopes, I had before me a busy scene of machines and human laborers—pulleys whirling overhead, belts driving wheels below, and an incessant clank-clanking noise, which renders it necessary to speak somewhat louder than a whisper, if one has any particular wish to be heard.

With respect to the material on which all this activity was exerted, I had seen it prepared some time ago at a mill in Hertfordshire. It is made, like any other ordinary paper, at a machine, and with a sufficiency of size in the pulp to prevent the ink from running. The introduction of the threads is a matter of extreme simplicity. From reels suspended over the pulpy substance as it goes below the first pair of cylinders, threads are led down and inextricably crushed into the web. After being cut into sheets, the paper is taken in reams to the factory which I was now visiting.

When the paper comes into the hands of Mr. De la Rue, it is so far unfinished on the surface that it requires to be milled, by being put through rollers in the manner which I have already described for smoothing sheets of paper or card. So much care is taken to insure finish of surface, that each sheet is milled five or six times before it is considered perfect. When it has undergone this tedious process, the sheets are laid in handfuls, of about six inches thick, beneath a cutting apparatus, which, for want of a better simile, I must describe as acting on the principle of the guillotine. A great broad knife is pressed by a powerful action down on the paper, and with the utmost ease severs the mass in twain. Having been cut into breadths, the paper is next, by the same instrument, formed into lozenge

shapes—this producing the least possible waste of material. In this form the paper is handed to the succeeding machine, where, coming under the action of descending angular chisels, small pieces are smartly notched from the corners, and the envelope is made, all except the stamping and folding.

Following a natural course of things, the envelope paper might now be expected to be carried to an adjacent apparatus for impressing the medallion stamp, which is to give it currency through the post. Circumstances divert it from this direct course. The presumed necessity for keeping a careful watch over the dies, prevents government from employing any but their own officers to impress the medallions, and the operation is accordingly performed at Somerset House, which, with a knowledge of this eccentricity of movement, I had visited the day previously. Conducted down to one of the lower floors of this large government office, I there found, in an apartment overlooking the Thames, a number of machines, of a very peculiar construction, engaged in stamping or printing the medallions. These machines, which, I believe, are the invention of Mr. Edwin Hill, superintendent of the stamping arrangements, may be considered as forming a combination of the printing-press and die-stamping apparatus. All are moved by a steam-engine of two-horse power. At each press are two lads, one placing the papers below the die, and the other removing them. The impressions being effected at the rate of sixty in the minute—an amazing celerity considering that the die is inked at every impression—the laying down and taking up require a sharp eye, and no small expertness of fingers. In such processes, every little matter requires to be studied, in order to economize time and trouble. Were a boy to try to lay down sixty pieces of paper in a particular manner within the period of a minute, without once missing, he should certainly fail in the attempt, unless he arranged the papers in a way convenient for handling before he began. The spreading out of the papers into handfuls, in the shape of a fan, is on this account an indispensable preliminary in the operation I am now describing. I was told that there is even a knack in rapidly forming the fans. After much experience, it has been found that it can be most expeditiously done by throwing the papers on a table covered with soft cloth, and passing a brush over them. Who, on using an envelope, could imagine that the mere mode of handling it has been a subject of so much solicitude?

In stamping, the die is suspended over the paper on which it is to be impressed, and consequently the inking is effected by rollers pressing upwards. Having thus to work contrary to gravity, the rollers require to be artificially pressed upon the die; and Mr. Hill's device of springs acting on the rollers to accomplish this object is at once simple and ingenious. So also is there great merit in the method of shortening and lengthening, at each impression, the screw and bolt apparatus to which the die is suspended, in order to afford room and time for the action of the rollers. It consists in interjecting and withdrawing a piece of metal at every lift and descent of the screw over the bolt: in other words, the power acts, first, by means of a rapidly-working screw; second, the piece of metal which is pushed below it; and third, the bolt to which the die is attached—all three being kept in a vertical line by the supports of the apparatus. The number of papers stamped by each press is, as I have said, sixty per minute, at which rate several machines,

with their attendants, work six hours daily; which, although little more than half the time occupied in ordinary printing-houses, is, all things considered, a fair amount for a government office.

Stamped and counted, the envelopes now retrace their steps to Mr. De la Rue's establishment, to which I again invite attention. Greatly as I had been delighted with the operation of stamping, I was still more pleased with that which now came under my notice. In folding an envelope, six movements are necessary. First, the paper must be laid down; four flaps must next, one after the other, be turned over; and sixthly, the envelope must be withdrawn, to make way for its successor.

All these movements, except the laying down, are performed by a machine of the height and size of a small table, with some interesting apparatus arranged over its surface; the whole the united invention of Mr. Edwin Hill and Mr. Warren De la Rue. A boy having laid down a lozenge-shaped paper, a hammer falls, and knocks its square central part into a crevice; and on the hammer rising, we see the four corners standing erect—the envelope having taken the form of a box, with standing sides and ends. A broad iron thumb, as I may call it, now rises and presses down one of the ends, another thumb presses on the opposite end, and next the two sides are similarly flattened. The envelope being now made, an iron arm comes forward with a rapid jerk, and with two fingers draws it away. It is not drawn aside into an indiscriminate heap, but is brought to a halt upon an endless strip of cloth, which, travelling over two rollers at a slow rate, gathers the mass of envelopes into regular bings, and thus obviates the necessity for shaking them even. The action of what I call the fingers is curious. Instead of drawing away the envelope, as if by hooked claws, the effect is produced merely by touch, the same as if you were to pull towards you a sheet of paper by the tips of two fingers. How two metal pointers could perform this delicate operation is the wonder. It is indeed a curiosity in art. The explanation is, that the pointers are tipped with India-rubber—a substance which will readily draw aside any light object by the touch, as an experiment with a morsel of rubber and sheet of paper will convincingly show. The interest attached to this apparatus is increased by observing that when the boy fails to place an envelope-paper on its appointed place, the two fingers are projected outwards and do not dip down to draw the envelope aside—as if there was a consciousness in the machine that any effort on this occasion would be thrown away.

The whole of the process of which this affords the scantiest outline, is a rapid evolution of parts all acting in harmony to effect a particular end, and without any perceptible interval of repose. The rapidity may be judged from the fact, that two thousand envelopes are folded per hour, or twenty thousand in the day. Yet this degree of quickness, I understand, is already beginning to be considered slow work, and will not be tolerated much longer. I should not be surprised, at my next visit, to see four times as many envelopes made in the hour, and the whole at the same time gummed and counted. As it is, the machine cannot keep the stamp-office supplied; and many girls are employed in executing quantities by hand-labor. At a former visit a year or two ago, I found that all the envelopes were folded by girls; and so active were they, that I could not have anticipated the invention of anything more smart and economical. The result

shows how useless it is for an onlooker to speculate on such matters. But still more useless would be the sentimental maunderings of those who affect to lament the substitution of iron and power-belts for human muscle and intelligence. The more machines Mr. De la Rue introduces into his work-rooms, the greater is the number of hands he requires to employ. "So far," said he, "from the folding machine robbing our girls of their employment, we have more work for them than ever." One can only have a forcible perception of the truth of this remark, by having visited, as I did, the establishment at two distant periods. On the present occasion, when conducted into the manual-labor rooms, I found that department thronged from the garret to the cellar—a houseful of girls, all as busy as possible at agreeable and remunerating labor; many folding at long tables, others gumming, and a third class finally putting the envelopes in packages ready for sale. The place was in itself a factory, and not the least interesting or curious on various accounts. As all the envelopes, whether made by machine or with the folder, pass through this department, I inquired how many were turned out in any given period of time. The answer was, that the quantity of envelopes all together made was seventy-five thousand a-day, or twenty-two and a half millions per annum, but that this was only those stamped for the post-office. The quantity of fancy envelopes manufactured was equally large. This led me to an examination of the kinds of envelopes made without stamps, of which there were numerous varieties in progress. One species were without borders; others were bordered with red, blue, or some other fancy color; and a third kind had narrow or broad borders of black for mourning. The preparation of mourning note-papers and envelopes seemed in itself a great concern. The putting on of the black I did not see, that being done out of the house by a person whose business is the blacking of paper. "To give you a notion of the extent of this kind of trade," said Mr. De la Rue, "I may mention that we pay £500 a year for merely blacking the edges of note and envelope papers." Equally ready, however, to pay the part of L'Allegro as *Il Penseroso*, this great man has not disdained to bring his ingenuity to bear on the important subject of matrimonial stationery. I am rather inclined to think that De la Rue prides himself a little on what he has accomplished in this way. And who that recollects what marriage-cards were a few years ago, can wonder at a man being proud of being the purveyor of such splendid things as now charm the eyes of misses—names, borders, wafers, and true lovers' knots, all in a blaze of enamel and silver!

Pleased with the way in which these pretty articles were got up, I felt a reluctance in quitting the department to visit that part of the premises devoted to enamelling, coloring, and varnishing. Enamel is a wash of a material externally resembling whitening, which, after being dried on the card or paper, is smoothed by milling. The mode of applying the wash is the only part worth noticing. I found several workmen and boys engaged in laying the wash on webs of paper, each three hundred yards long; and this length they finished in half an hour. The actual operator, however, is a machine, and the men and boys are only attendants. The web, in going into the machine, passes beneath a trough, from which the wash issues over the surface; it then comes under the action of an apparatus of brushes, moving in cycloidal curves, by which the

wash is finely equalized; led away from this, the web sinks through a hole in the floor to an apartment beneath, where it is caught by a boy, and hung on poles to dry. The paper undergoing this initiatory process of enamelling at the time of my visit was that designed for covers to "Chambers' Miscellany of Useful and Entertaining Tracts," of which some hundreds of thousands have been prepared.

The adjoining workroom, in which papers are colored and varnished, had somewhat the appearance of a painter's and dyer's atelier. At various benches, girls were employed tinting sheets of paper by means of brushes and colors; others were putting varnish on the dried sheets; and a few were laying squares of leaf metal on paper preparatory to future processes. Much of the colored, as well as the metal-colored paper, is designed for embossing; hence it was natural for us next to look in upon the apparatus employed in giving the embossing or stamping finish to the material. Embossing is done in two ways—whole sheets by means of rollers, and small slips by means of powerful stamping machines. In little more than an instant of time, a sheet, formerly smooth, will pass between rollers, on one of which the pattern is engraved, and come out beautifully marked in relief. The appearance of morocco leather is thus given to colored papers. The process of stamping is performed on the ground-floor, in consequence of the enormous weight of the presses. The largest of these machines is about eighteen feet high, weighs twenty tons, and imparts a blow equal to a thousand tons. From my previous acquaintance with machines of this class, I should have expected that the Goliath before me would require great toil in working, and was therefore agreeably surprised to find that it performed the falling and rising process with comparative ease and equability. Two men only were in attendance upon it: one placed the slip of paper below the die, taking it out when stamped; the other guided the movement, by putting the machine in and out of gear with the steam power. The blow being given with a rapid and ponderous jerk, which shook the ground and building, the reaction caused the screw to run back, leaving time to shift the paper for the ensuing impression. The article which was in hand during my visit was what few persons could have expected—the fancy slip of paper which is wrapped round pieces of linen. It is very true that linen is not a whit the better for ornaments of this kind; but it is equally undeniable that people are taken with such embellishments: the eye is pleased if not the judgment, and how much are all mankind imposed on by what charms the senses! As to the slip in question, what was it radically but a bit of paper, not worth a farthing! Yet what did art not do for it? In the first place, it daubed it over with a pea-green color; next, it gave it a gloss rivalling the surface of polished marble; then it pasted upon it, in the form of a medallion, a small representation of a flower on a white ground; after this, it laid leaves of gold upon it; and lastly, giving it a blow with a die, there sprung up in relief a beautiful golden efflorescence, surrounding the medallion, and radiating over the delicate green expanse of the slip. The execution of the design on the die was an important step, not to be overlooked; for independently of all manual labor, the drawing, effected by one of the first artists of the day, cost as much as twenty guineas. Thus it is that things are done on a great and liberal scale in large factory concerns; the most

insignificant materials being exalted to a high value by the varied and ingenious operations of artists and artisans, set to work by capital and enterprise.\*

In the same department I observed several smaller stamping-presses engaged on different articles requiring to be embossed. One was employed in embossing a highly ornamental calling card: the relief in this instance, however, being open, to resemble lace. The card being first embossed by a blow of the die, is next laid, face downwards, on a block, and in this position the raised dots are filed off; consequently, on taking it up, we find that the embossing is full of small holes. Another press was engaged in stamping leather for the covers of work-boxes and writing cases. Near to this scene of labor I was shown the process of printing in metals. A number of small presses of an ordinary kind, and several men and women, are here occupied. Printing to resemble gold and silver has been brought by Mr. De la Rue to considerable perfection; and yet it is so simple, that I can see no obstacle to its general use. Properly speaking, the metal is not printed, but laid on the typography after the sheet comes from the press. Instead of ink, the types are rolled in a glutinous substance, to which metal in powder readily adheres. The metal, to resemble gold, is an oxidised brass; and so vast has become its consumption, that there is now a manufactory of the article in London. Beat first into leaf, it is afterwards ground to powder; and the daubing of this powder on the typography appears to be the duty of the work-women. In this manner all those covers of packages containing note-papers which blaze in gold and silver, are produced. After printing and metalling, the papers go through a wash and milling, to impart a glossy finish.

From the metal-printing department I was led up stairs to that in which are manufactured all varieties of portable writing-desks, work-boxes, and cases, also portfolios, albums, needle-books, and other loves of articles that no young lady could for an instant see without meditating an attack on papa's pocket. Here, likewise, I was made conscious for the first time of that great work of art, a portable chess-board—a thing made of paste-board, which, with pieces and all, you can fold up in your pocket, so as to be able to carry on a game in a stage-coach, railway carriage, or steamboat. Invented by a learned professor, this little affair has, to use De la Rue's gratulatory expression, "taken root," and is therefore likely to turn out a good thing for the concern. To chess-players, I should imagine it to be an indispensable pocket companion. Unable to save themselves, they may just as well go and buy one of these portable boards at once, as wait to perform that act ungraciously afterwards.

I had now seen pretty nearly into all the odd nooks of this interesting establishment, and my last move was into the store-room, in which were engaged ten clerks and packers, despatching goods to all parts of the empire. Here, in conversing with one of the partners, I learned that the whole house is under from fifteen to twenty foremen, with

\* While on this subject, it is not out of place to speak with admiration of the embossing of card-board by Messrs. Dobbs, Bailey, and Co., of 134 Fleet street, London. By them bas-relief copies of the cartoons of Raphael, and the masterly pictures of Wilkie, also relieve maps of different countries, have been executed with much taste and at a comparatively insignificant cost.



each of whom a debtor and creditor account is kept, as if he were an independent tradesman. It is only by such minute arrangements that a dispersed miscellaneous establishment like this could be conducted with propriety or advantage. At any given time, it can be ascertained whether any particular branch is yielding work proportional to the expenditure upon it. A number of the foremen were originally lads employed in the early years of the establishment; and with them, as well as with others, the masters are upon a most amicable footing. Solicitous to improve the condition of all in their employment, the proprietors have latterly induced them to abandon the practice of taking beer twice during the hours of labor, and in lieu have remitted half an hour from the general day's work. A marked social improvement has been the consequence. Latterly, also, a sickness-fund and library have been set on foot in the office. As these useful institutions have a reference to something like three hundred individuals, the degree of benefit is of more than ordinary importance.

There was now nothing more for me to see or hear of in connection with this extensive establishment, and thanking my friendly conductors for the trouble they had taken to explain the different processes, I concluded what I hope will have been as little tiresome to my readers as to me—"A DAY AT DE LA RUE'S."

From Chambers' Journal.

#### HARVEY AND THE CIRCULATION OF THE BLOOD.

It has not unfrequently happened that, at wide intervals of time, certain speculative or inquiring minds have had glimpses of a truth—of some great natural fact. They have seen an effect, without being able to trace it to a cause—a portion of an outline, of which they were unable to make a finished picture. A long descent through many brains has seemed to be necessary for the entire elaboration of the principle; and although there may be something grand and startling in the discoveries which at times flash upon the world as the result of hazard, yet those which have been the work of thought, observation, deduction, and experiment, carried on laboriously through many years, forcing their way, as it were, into existence, are not the less worthy of our respect and admiration.

The history of the discovery of the circulation of the blood by our countryman Harvey, presents itself as an interesting illustration of the views here thrown out. Constituting, as it did, a fact of the highest importance in the human economy, giving a new form and purpose to physiological science, it nevertheless met with the usual fate of great truths, being received with ridicule, jealousy, and detraction.

William Harvey was born at Folkstone, in Kent, on the 2d of April, 1578. He acquired the elements of learning at a school in Canterbury, and finished his education at Cambridge. Eldest of a family of nine, he was the only one who manifested any inclination for science. Having determined on devoting himself to medicine, he set out, at the age of nineteen, on his travels to France and Germany, visiting the principal anatomical schools on his way to Italy, in which country he studied anatomy for some years under the celebrated Aquapendente, founder of the school of Padua. Harvey devoted himself zealously to this pursuit. Before his time, anatomy had been nothing more than a speculative science, distorted by many absurd and superstitious

notions; and the hindrances opposed to the dissection of the human subject, proved a formidable impediment to more accurate or rational researches.

Aquapendente had noticed the valves of the veins in his dissections, but it does not appear that he had any idea of their real use or importance. The sight of these was doubtless the cause of Harvey's investigations, and moved him, as he says, to write, "to find out the use of the motion of the heart; a thing so hard to be attained, that, with Frascatorius, he believed it known to God alone." He goes on to say—"Almost all anatomists, physicians, and philosophers to this day, do affirm, with Galen, that the use of pulsation is the same with that of respiration, and that they differ only in one thing—that one flows from the animal faculty, and the other from the vital, being alike in all other things, either as touching their utility or manner of motion." It is evident that he was not unwilling to do justice to the labors of his predecessors, for elsewhere, to use his own words, he is thinking "to unfold such things as have been published by others; to take notice of those things which have been commonly spoken and taught, that those things which have been rightly spoken may be confirmed, and those which are false, both by anatomical dissection, manifold experience, and diligent and accurate observation, may be amended."

Once on the track, Harvey followed it up with unflinching perseverance: new facts came to light, and cheered him on with the hope of ultimate success. "Observing," he remarks, "the valves in the veins of many parts of the body so placed as to give free passage to the blood towards the heart, but to oppose the passage of the venal blood the contrary way, I imagined that so provident a cause as nature had not thus placed so many valves without design."

At length Harvey believed he "had hit the nail on the head;" and having become a fellow of the College of Physicians at the age of thirty, he was appointed professor in 1616, when he commenced a course of lectures, and for the first time modestly announced his great discovery of the circulation of the blood. Content to go no farther for a time than in the hints thrown out, he waited with patience, until time had fully matured his views, before he gave them to the world. In the year 1628, when he was fifty years old, his researches were first published at Frankfort, in a small quarto volume, entitled *Exercitatio Anatomica de Motu Cordis et Sanguinis*,\* dedicated to Charles I. In this work, as has been truly observed, "Harvey, by his genius, followed nature in her windings, and forced her to unveil herself." "Scarcely one of the proofs which demonstrate the circulation escaped his researches; he showed it not only in certain parts, but followed it to its recesses—to the liver—where other anatomists had lost themselves. His book is one of the rare essays which exhaust the subject; it is short and comprehensive, clear and profound, dictated by reason and experience."<sup>†</sup>

He had diligently and perseveringly extended his inquiries beyond the human subject, with a view to verify his facts by comparison. The king, who, with all his errors, entertained enlightened views on science generally, placed at his physician's disposal the deer in the royal parks near London; and in addition to these, the zealous anatomist minutely

\*Anatomical Researches on the Motion of the Heart and Blood. Haller called this work *Opusculum Aureum*, (small golden treatise.)

† Senec. *Traité du Cœur*.

examined the hearts of other mammalian animals, as well as of birds and fishes. His book contains an explanation, in clear and concise language, of the general mechanism of the circulation, and incontestable proofs of the truth of his theory. His own words will best convey the certainty and accuracy of his views. In the chapter on the action and office of the heart, he remarks—"First of all, the ear (as the auricle was then called) contracts itself, and in that contraction throws the blood with which it abounds, as the head-spring of the veins, and the cellar and cistern of blood, into the ventricles of the heart." After its passage through the lungs and body, "it returns to the heart, as to the fountain or dwelling-house of the body; and there again, by natural heat, powerful and vehement, it is melted, and is dispensed again through the body. The pulse of the arteries is nothing but the impulse of blood into the arteries."

Harvey's biographer, Dr. Friend, writing on the discovery, observes—"As it was entirely owing to him, so he has explained it with all the clearness imaginable; and though much has been written on that subject since, I may venture to say his own book is the shortest, plainest, and the most convincing of any." We find the celebrated Boyle, who was contemporary with Harvey, not less candid. He remarks in his philosophical works—"Late experiments having shown the use of the blood's circulation, and of the valves in the heart and veins (which, the famous Dr. Harvey told me, gave him the first hint of his grand discovery,) we at length acknowledge the wisdom of the contrivance, after it had escaped the search of many preceding ages."

The extreme care with which Harvey must have pursued his inquiries, may be best understood by what is perhaps the most striking phenomenon in his important discovery—that of the independent motion and life of the blood itself. He noticed the gradual cessation of movement in the ventricles and auricles in dying animals, and goes on to say—"But besides all these, I have often observed, that after the heart itself, and even its right ear, had, at the very point of death, left off beating, there manifestly remained in the very blood which is in the right ear an obscure motion, and a kind of inundation and beating."

It might be supposed that a discovery of this nature presented nothing to shock the prejudices, or disturb the interests, of any portion of the community. Yet, as remarked in Wotton's Reflections, "a great many put in for the prize, unwilling that Harvey should go away with all the glory." A host of those who are always ready to combat facts by reasoning fell upon him. He was overwhelmed with contradictions from the learned, and neglected by the public generally; and as soon as his claims were contested, his practice as a physician materially diminished. Such was the acrimony of his opponents, that he was denounced to the king as guilty of improper dissections; an accusation which, had he not enjoyed the favor of the sovereign, might have been attended with fatal consequences, in a day when violent prejudices prevailed against experiments on the human subject. Many asserted that the discovery was nothing new; that it had been known long before: others contended for the honor as due to themselves; and some referred it to Hippocrates, from whom Harvey was said to have stolen it.

The ancients, in reality, knew neither the theory nor the laws of the circulation. They entertained the most absurd ideas on many physiological and

anatomical points relative to this phenomenon, and were altogether ignorant of the important part played by the lungs in this great function. The Chinese were said to have been acquainted with the movement of the vital fluid from time immemorial; an assertion which appears to have solely rested on the attention always paid to the pulse by that singular people. Hippocrates is the earliest author who makes any allusion to the subject; he speaks obscurely of the usual motion of the blood and distribution of the veins. Plato represented the heart as a species of divinity, that poured out blood to every member of the body; and Aristotle, who uses the word *arteria* for *windpipe*, speaks of a recurrent motion of the blood, comparing it to the ebbing and flowing of the sea in the well-known channel of Euripus: these opinions were, however, founded on mere conjecture, not on actual demonstration. Galen, who believed that the veins originated in the liver, endows the body with "three kinds of spirits, natural, vital, and animal, corresponding to the same number of faculties or functions." The seat of the natural was in the liver, for the growth and support of the body; the vital he assigned to the heart, for the development and carrying about of heat; and placed the animal in the head, as the source of sensation and motion. The arteries were supposed to be nothing more than passages for air or "spirit," as after death they were found empty; from which circumstance they derive their name. Cicero, in his treatise, *De Natura Deorum*, has the phrase—"Sanguis per venas, et spiritus per arterias."

These doctrines prevailed until the time of Servetus, who, better known as a theologian than physician, fell a victim to the religious fanaticism of the Calvinists of Geneva. His writings contain many remarkable facts; among others, a description of the pulmonary circulation, with which it appears he was imperfectly acquainted. His suppositions, however, were not founded on actual experiment. Like Galen, he made the body the abode of three spirits; one of which, the ærial spirit or pneuma, was seated in the heart and arteries. After Servetus, Columbus, a physician of Cremona, threw further light on the circulation through the lungs, yet he remained entirely ignorant of the part played by the arteries. To him we are nevertheless indebted for a description of the uses of the valves of the heart. He was followed by Cæsalpinus, first physician to Pope Clement VIII., who held some clear views on the subject; but being continually engaged in scholastic disputes, his allusions to it are, in most cases, incidental and obscure; and notwithstanding his verification of the labors of his predecessor, his works abound in glaring errors. With the exception of applying a ligature, below which he noticed the swelling of a vein, he appears to have added nothing new to the theory of the circulation.

Amid all this ignorance of the true functional action, the wildest speculations prevailed. The heart was taken as an oracle, and its beats were listened to as prophetic. Some contended that the use of the veins was merely to keep the blood in equilibrium, and prevent undue accumulation in any part of the body. Others, again, bewildered themselves with calculations on the power of the heart, and believed that it exerted a force equal to 3,000,000 of pounds; a notion speedily combated by a third party, who proved, to their own satisfaction, that the power did not exceed eight ounces. Although modern science has stripped

off these marvellous attributes from what Seneca calls "the material soul of living bodies," and made it a hydraulic machine, yet we find no less cause for wonder and admiration at its mysterious powers.

To return to Harvey. It was for removing this mass of error, for laying bare the most admirable mechanism the world has yet seen, that he was assailed by the envious and ignorant from every quarter. How well he did his work, we learn from Jenty, according to whom, he, "with indefatigable pains, traced the *visible* veins and arteries throughout the body, in *their whole* progress from and to the heart, so as to demonstrate, even to the most incredulous, not only that blood circulates through the lungs and heart, *but the very manner how*, and the time in which that great work is performed." To this "indefatigable pains" we doubtless owe the six large diagrams, of the size of life, still preserved in the College of Physicians, showing all the blood-vessels of the human body; and prepared with such nicety, as to display distinctly the semilunar valves at the entrance of the aorta, by which he used to illustrate his lectures. The delivery of these lectures, however, involved him in much suffering and loss. In the confusion and riots of the civil war, his house in London was pillaged and burnt, with many valuable papers, whose destruction was irreparable, and caused him constant regret. "In the eyes of his contemporaries, he was looked upon only as a dissector of insects, frogs, and other reptiles." And on the authority of Aubrey, we learn that Harvey said, "that, after his book of the Circulation of the Blood came out, he fell mightily in his practice. \* \* \* 'T was believed by the vulgar he was crackbrained; and all the physicians were against his opinion, and annoyed him."

The persecution of Harvey appears to have been prompted only by the mean passions of his contemporaries. No other motive is obvious; for it is difficult to see in what way "the craft" was endangered. In his case, however, as in many others, it almost appeared as if men had some strong personal interest in keeping back the truth, so eagerly did they exert themselves to resist it. Carere, rector of the academy of Perpignan, wrote a thesis against the doctrine. It was also attacked with great virulence by Dr. Primrose, and by Riolan, the celebrated French anatomist. Harvey nevertheless found friends. Folli, physician at the court of the Medici, the first to attempt the transfusion of blood, was an ardent propagator of his theory. In his own country, he gained a powerful advocate in Sir George Ent, who published a book in his favor. The "momes and detractors" were also replied to in temperate language by Harvey himself. He says—"I think it a thing unworthy of a philosopher, and a searcher of the truth, to return bad words for bad words; and I think I shall do better, and more advised, it, with the light of true and evident observations, I shall wipe away those symptoms of incivility." To those who taunted him with being nothing more than a dissector of insignificant reptiles, he replied, with as much truth as impressiveness, "If you will enter with Heraclitus, in Aristotle, into a work-house (for so I call it) for inspection of viler creatures, come hither, for the immortal gods are here likewise; and the great and Almighty Father is sometimes more conspicuous in the least and most inconsiderable creatures."

Harvey attended the king in his journeys during

part of the civil war, and was present at the battle of Edgehill. He afterwards retired to London, in the neighborhood of which city he passed the remainder of his days. In his seventy-fifth year he built and endowed a library and museum for the College of Physicians. He died in June, 1657, at the age of seventy-nine, but not before the truth of his doctrines had been generally recognized; and his own professional brethren were proud to do him funeral honors. He was buried at Hempstead, where a handsome monument, surmounted by a marble bust, was placed over his grave by the College of Physicians. It was said of him that "his candor, cheerfulness, and goodness of heart were conspicuous in his whole life, as well as in his writings, and exhibit a worthy pattern for future imitation;" and that one of his noblest characteristics was love for his profession, and a desire for the maintenance of its honor.

What a striking commentary do these facts afford on the ignorance and selfishness of society! How easily have the many suffered themselves to be led by the interested few, whose motives were too often of the most despicable character. This is the more to be wondered at, as experience, if not policy, might have dictated the question, *cui bono?* How was this answered in Harvey's case? Hobbes says of him, he "is the only man I know, that, conquering envy, hath established a new doctrine in his lifetime"—and yet twenty-five years elapsed before this was accomplished. For a quarter of a century had this great truth to struggle against the malice, jealousy, and stupidity of its enemies, who denied the discoverer's claim to originality, with as little reason as those who disputed Galileo's discovery of Jupiter's satellites, on the ground that a Dutchman had previously invented a telescope. Mankind, however, have always been prone to persecute new truths; whether they shall continue to do so, depends greatly on the present generation.

Harvey's reputation has now nothing to fear. The circulation of the blood is universally admitted to be the *first* great discovery after the promulgation of the Baconian method; and though giants in mind have lived since, with all the facilities which use and example in the inductive method have given, only one greater and more complete discovery—the discovery of gravitation—has ever been made.

THE first volume of a work intended to completely exhibit *England's Colonial Empire* has just been issued by the enterprising colonial publishers, Smith and Elder. The author is Mr. Pridnam, who, in a modest preface, apologizes for having at so early an age undertaken so gigantic a task. The first volume, however, shows no lack of either ability, research, or knowledge. It is occupied with an excellent account of the Mauritius, divided into four parts: the first part gives its history from its discovery by the Portuguese to the present time; the second describes its inhabitants and their institutions and state; the third its physical features and natural productions; and the fourth its industry, commerce, and government. As we are tied to space, we can only say, that ample information is given on all these heads, and that, regarding the extent of the author's design, and the evidence he gives of the requisite qualifications to carry it out satisfactorily, we make no doubt that his work will be a valuable addition to the history and geography of our colonial empire. The present volume is complete in itself.—*Britannia.*



From Fraser's Magazine.

## THE STORY OF THE PRETTY OLD WOMAN OF VEVAY.\*

Few, if any, of our common-place sayings, are less contradicted than that which asserts all human expectations to be liable to disappointment. So I philosophized as I stood on blue Leman's shores, and beheld for the first time Geneva and her far-famed lake. I could scarcely remember a period in my life when I had not imaged to myself more glorious things than even poets, romancers, or philosophers had sung or said upon these beautiful shores; and when the wish of my childhood was realized, and I beheld with my waking eyes the vision of my day-dreams, the sensations I experienced were those of keen disappointment, mingled with a degree of doubting surprise.

"Is this, then, Geneva?—is this the Lake of Geneva?" I repeated.

"Oh, you will be more satisfied when you go to Vevay!" was the response.

And to Vevay I went, and at Vevay I was satisfied.

A curious little journey it was that I made to Vevay. It has supplied me with remembrances utterly unknown to those of the million who have travelled the same little distance in their own luxurious carriage and with their English-speaking courier.

The memory of that journey has floated over my brain ever since, until at last it has become a sort of necessity to put its history on paper.

I went in a small diligence from Geneva to Vevay. When I had entered it the other places were almost immediately occupied (with the exception of one) by some country-looking women, who certainly had not the smallest pretensions, either in dress, manner, or appearance. One of them was, indeed, so remarkably and curiously ugly as actually to cease to be disagreeable. I contemplated the combination of ugliness in her face and features with a degree of interest. Another, who sat beside me, was the prettiest little creature, for a woman who must have been fast completing the latter part of our allotted scores of years, I think I ever saw. Her color was a lively rose; her bright brown eyes shone with an animation which gave them more than the mere fire of youth. All her features, though, in correspondence with her figure, they were small, were almost perfect in form; but, alas! her lips, which had once undoubtedly been as the opening rose, or twin-cherries on one stalk, had considerably fallen in, for all the pretty dame's front teeth had fallen out, and the little pointed chin, with a sort of expression peculiar to itself, was more *retroussé* in consequence. As for the whole face, you could scarcely help smiling when you looked at it. Yet, while its expression was decidedly merry, there was something more than mirth to be read in it, at least by a discerning eye.

The ugly woman had an immense pocket in front of her checked apron, filled with roasted chesnuts, which she kept offering with assiduous hospitality to all our company. But while I was engaged in observing the beauty that had sustained the wear and tear of more than threescore years, and the ugliness that had, perhaps, become fondly familiar

\* The circumstances of this story are related just as they really occurred. But the history of the young countess is here related in the first person, instead of being given in the more lively language of the pretty old woman of Vevay.

to some loving eyes for half that time, an exclamation of dismay, almost amounting to horror, attracted my attention to the door of our vehicle.

It came from such an animal—such a contrast to the diligence and its freight. It—I use the neuter pronoun as the most appropriate—it was one of those beings who have appeared in France since Algiers became one of its country towns—half-Arab, and, I was going to add, half-woman in costume. But let me describe it.

A short, *embonpoint* figure, with long curled hair, long beard and moustache; a cap of blue cloth, worked with gold thread, on its head, a loose pelisse of fine purple, with a capote or hood, and wide sleeves, turned up with black velvet nearly to the elbow; very wide trousers, nearly of the same color, terminating round the waist, with a splendid sash of heavy silk, brilliant in gold, crimson, and purple dyes—a vest most daintily delicate.

Is it marvellous that the shriek of dismay had burst from such an exquisite creature on the prospect of being immured alive in a diligence full of such company as I have described? He declared it to be impossible he could enter; and we had to wait a full quarter of an hour in the street while he was debating the important subject. At length, after a violent altercation with the *conducteur* on the iniquity of transporting such people from place to place, some £ s. d. reasons probably made him compromise his dignity, and gathering his clothes as tightly as he could around him, with a deep sigh or moan, a look of suffering, and the prettiest air of mingled heroism and timidity, he put himself and his pelisse carefully into our vehicle, scarcely noticing the offer of the ugly woman to go outside, and leave more room for both articles in the corner he appropriated. I fear I was indulging in reverie on the follies and vulgar impertinences of this strange world of ours, when I was awakened into a broad smile by the ugly woman asking the pretty one, with an easy nod of her head towards the fine young monsieur, if he were her *garçon*, using the word in one of its senses—bachelor or lover.

The hearty laugh of the little old creature it was difficult not to join in, although the horror and aversion depicted in the rueful face of the subject of their merriment, might have been an antidote to its influence.

"My *garçon*!" she cried, turning fully round to the terrified-looking man, and gazing at him as if he were ignorant of their language, or a sort of nonentity with whom reserve was unnecessary—"my *garçon*! he is too young for that, I think; if you had said my son, indeed, it might well be."

"Undoubtedly, yes," returned the other, with apparent simplicity, though it was easy to see the simplicity was assumed, and that they were both good-humoredly revenging themselves for the contempt of our exquisite companion; "yes, so I meant, certainly. Your son, ah! he is too young to be your lover—I see that now!"

The half-Arab darted such a look at me, whole pages of indignant notes of interrogation were written therein. In spite of my politeness, I smiled a well-pleasing answer. He clearly saw that the indignity and insult to which he was exposed met with no sympathy. Besides, he saw me eat some roasted chesnuts which the ugly woman offered me from the great pocket of her apron. So he prudently considered that it might be as well not to disturb the suppositions of the two old dames, since, as there were two other female tongues ready to spring into action, it might indeed be only

stirring up a hornet's nest. So he stayed quite quiet, until, thinking they had gone far enough in their decisions respecting his relationship or future destiny, they began to look out of the windows, and the pretty woman, as if for the first time attracted by a great staring notice on the way-side, called out—

"Look there! what folly!—they have written up 'The road for Italy,' and it is the road for Vevay!"

The utter simplicity of this speech, in our Algerian's opinion, quite conciliated his wounded vanity, for it was ridiculous to be mortified by such ignorant creatures; and his harmless countenance resumed its self-complacent expression, as he threw me a glance of condescending pity, and, repeating "The road for Vevay!" added, with infinite condescension, turning to the speaker—

"You have never been farther than from Geneva to Vevay in your life!" while his tone almost syllabled the inference, "I have been to Algiers."

"Yes, I have been further," she replied, turning her bright, dark, smiling eyes, with a rather knowing sort of look, upon his face.

"Indeed!—not so far as Lyons, however?"

"Yes, farther."

"Impossible! What! to Marseilles?"

"Even to Marseilles," she replied, nodding her head, as if she might say more.

"And what could bring you there?" demanded the travelled man, measuring her with his eye from head to foot; for a Frenchman who has travelled a little thinks a great deal of it, and a travelled woman is a sort of wonder.

"It was on account of an Inclination I had," the old dame answered.

I did not understand the word "Inclination" so used, and the laugh of our fellow-traveller was therefore unintelligible, until he told me that she had gone from Vevay to Marseilles on account of a lover.

"Was your Inclination, then, at Marseilles?"

"No, at Vevay."

"Then you forsook him!—was that the other day?" with something of a sneer.

"It was about fifty years ago; I was sixteen then."

"But how then!—your Inclination was at Vevay, yet, on his account, you went to Marseilles, at sixteen?" still interrogated the other, whose curiosity was evidently overcoming his exclusiveness.

"Yes, he was too good—too high for me!" she replied, and her eye was less bright, and even her cheek less pink, when she spoke the words, though half a century had passed away.

"You know M. M— of Geneva, perhaps?" she added.

"By name, yes," was the answer; "a most respectable family."

"Well, it was his brother."

An exclamation of wonder was uttered at the intelligence.

"And he forsook you?"

"Pah! listen, and you will not say so."

"Then you married your Inclination?"

"Patience!—I say no! Did you never hear that M. M— had one brother—an elder brother, who went away on his travels when he was quite young, and was never heard of more?"

"Certainly, that is a well-known story."

"Well, he was my Inclination. He lived generally at Vevay with my father; he studied there, and lodged with us. My father was under great obligations to him. Claude was a few years older than myself; we were almost always together.

Well, it is an old story now! He loved me—yes—I loved him: that is all of it.

"At last I had passed my sixteenth year; it was high time to be married then. He wished to marry me; he knew his parents would not consent, but he declared his sentiments to my father, and for his sole answer he received a dismissal from our house, and a command to return to his father."

Our Algerian nodded his well-covered head approvingly.

"That was honorable and just to his benefactor. Did your Inclination acquiesce? He should have taken you off at once."

"He submitted entirely, but it is true he whispered to me sometimes an assurance that my father would yet change his mind. He was allowed to stay some time longer with us; but, to prevent all danger, my father resolved to marry me to a rich old widower who sought my hand. He had a son older than my Inclination. Bah! it was a contrast a little too striking! I knew my Inclination would never change his mind, and I could not think of ever marrying any one but him."

"Assuredly, one should only marry the person one loves."

"Yes, and then to marry one as old as my father! Well, I knew if I resisted, M. M— would be desired to recall his son, and I knew he would regret leaving Vevay, and I knew I ought not to wish to be his wife; so when I saw my father was resolved on marrying me to the old man, I said to myself, 'It is you, Minette, that must depart. You must leave all—father, mother, lover, Vevay! yes, better leave them all than be degraded and miserable!'

"I had a comrade, a young girl who had been at Marseilles. I made her my *confidante*; she gave me a letter of recommendation to a relation of hers who had a *magasin* in that town. Finally, I set out on foot and in secret; I got on I know not how, and reached Marseilles."

"And your Inclination?"

"He knew no more of me than any one else. When every inquiry had been made for me in vain, he went away, some say to sea, and was never heard of more!"

"Well, what did you do afterwards?" said her curious questioner, who was evidently relaxing into a singular degree of sympathy with the pretty old woman.

"I remained at Marseilles; the merchant was good to me; he had no children; I learned to manage his affairs; I was quick then, expert at all. Finally, the revolution had broken out; it was the reign of terror. Just then I got a letter from my comrade at Vevay; she told me that my old lover, the widower, was dead, that my parents had suffered for me deeply, and her conscience accused her of favoring my departure from them; she told me that my Inclination was gone, no one knew whither, and that they were without joy or consolation. I resolved to return home; I wrote to my father, telling him I was alive and well. I did not ask his forgiveness, but I promised to return to him, and to obey him in all things except in marrying any one but my Inclination. It was very hazardous to travel then, but it was hazardous also to stay still. Some time after I had arranged to return to Switzerland our merchant came to me; he looked pallid and distracted. He called me into his closet, and, shutting the door carefully, asked me if I were determined to make that journey. I answered,—

"Yes."

"These are perilous times, Minette," he said. "You are very young—you are so pretty, too!" He went on thus, as if thinking of something else. "You are so very pretty, Minette, you are more likely to be observed."

"Voilà un malheur de plus!" I replied; but I could not help it, you know.

"Yet you are prudent, Minette," the old man continued, "and you have courage; more, God help me, than I have!"

"I saw now that he had some real cause for anxiety or fear, and I answered him—

"Yes, I have some courage, if you wish to make use of it."

"Not for myself, my girl, not for myself; but, in short, there is a young lady here who wants to get to Strasburg, if she could travel with you."

"Certainly; why not?"

"Ah! these are sad times, my child—dangerous times. She is ill, Minette; she must be ill all along the road. You understand, you must be her *bonne*, her nurse, act for her, speak for her; she must not appear, she must recline in the carriage, and be supported when she descends, well wrapped up, so as not to be exposed to the air. There is much of this sickness abroad now, Minette!"

"I looked at him, and then I said—

"Yes, there is, I know, much of this sickness abroad now; it is because the blood is let to flow so freely. You may employ me; I will be the poor lady's nurse."

"Brave girl!" he cried, "brave Minette, you have divined all! yes, we can trust you! Come, you shall see this sick lady—this poor bleeding dove!"

"I never had seen our master thus agitated before; he was always fearful, but now he had cause to be so. The daughter of a noted royalist had taken refuge in his house. He led me upstairs, and, by a long passage, we reached a wall, in which he had made a secret door, to be used in case of danger. This conducted to a large loft beneath the roof of the house; on entering I beheld a spectacle that yet appears to be present to my eyes.

"A light and tall figure, clothed entirely in white, lay along the couch that had been carried thither; the dress was torn and disarranged, but the feeble lamp-light rendered its whiteness more discernible than the daylight would have done; for it was dirty, too. A veil of rich lace still partly covered the head, which had no other covering save the rich and beautiful hair which fell from it in the wildest disorder; pieces of white orange-blossoms, fragments of a wreath that had evidently bound it for a bridal-day, were still caught, here and there, in its locks.

"A slight convulsive tremor caused that form to quiver as we entered; the head was raised; the eyes looked forward with a fearing, inquiring gaze. The paleness of death was on the sweetest face I ever saw in my life. One small spot on the upper part of the cheek was flushed with a feverish red.

"She regarded me fixedly with those large, open, deep blue eyes, as if scarcely conscious of what was going on, yet indistinctly sensible of the relief of a woman's presence. The merchant approached her with an air of deep respect, and spoke some words in a conciliating tone. She started on hearing them, looked eagerly at me, and, crying out in a broken and feeble voice—

"She will take me—she will bring me to him!" stretched her arms towards me.

"I ran to her, she fell on my bosom; I wept, and a few tears then dropped from her eyes. The merchant said—

"Thank God, she weeps!"

"After this I did not leave her. Night came on; she at first resisted my attempts to disrobe her of her soiled and torn, but rich dress. She felt, however, as if against her will, the relief which a bath and a bed afforded, and sank into a sleep that restored her brain, and, perhaps, saved her from madness.

"She opened her eyes with a cry, an exclamation of fear and horror, and the words, 'My father, my father!' When she recognized me at her side, she held out her arms again, like a frightened child, and, throwing herself on my neck, said—

"You are surely my good angel! I recognize your looks as such! God tells me by you He will save me. What are you called?" she added.

"Minette, madame."

"Ah! you need not say madame, I am only mademoiselle. But listen, Minette, you shall know all. Our merchant here is afraid, he thinks you will be so too, and does not wish you to know all, at least till we reach Strasburg—"

"Vevay, mademoiselle—I go to Vevay."

"Vevay, then; you will leave me at Vevay, will you? No matter, God sent you to me. He will send me another Minette." I was touched by this piety, and the poor girl continued, "Yes, you shall know all, I will not lead you blindfold into danger. I shall have courage now, and calmness, to relate it all to you; you will then know who you will have to do with; and if you have courage as well as goodness, well; if not, it is better not to deceive."

"Mademoiselle lay quiet a few minutes, and then having tried to compose herself for the task, pressed her hand on her lovely brow, and said—

"You have heard, Minette, of the dreadful deed committed not more than nine days since in the neighborhood of Vaucuse?"

"Ah, truly, I had! and all the world beside; for the whole population of a village had been murdered, the village itself burnt to ashes, because the Tree of Liberty had been cut down in the night."

"They cut down the Tree of Liberty!" cried mademoiselle, flinging her head upon the pillow, and burying her face in it as if to shut out some horrible image. "It was in honor of my marriage the fires were kindled, and the guns fired at the poor people!"

"Hush, hush!" I said; "if you commence thus, you must not go on; and I have no wish to hear anything, unless it may be of use to yourself by showing me how I must act so as to serve you. But if, as you say, your good angel has sent me to save you, will you, by giving way to despair, lose the chance of saving yourself?"

"You are right, Minette!" she answered, with a sob; "you are wiser than I am. My senses at times fail me. Pray to God for me, Minette, that I may be calm. I want you to know all, that you may also know what you may have to expect. Listen to me now. My father, the Comte de V—, was the proprietor of the ill-fated district you have heard of; his château was not far from



that village—nearer to Vauluse. I was his only child—his heiress—an idolized one, what need had I to acquire your firmness and patience!—all was softness and peace around me. My mother, happily for her, died some years ago. Many have sought my hand in marriage; but even from childhood, my distant relative, Henri de Renzi, alone had shared my heart with my beloved father. He had loved me, and I loved him as my life. Life! yet it is dear—oh, how dear!" cried the poor young countess, with an affecting look of feebleness; "I never knew how dear until I saw that hideous death!"

"There was a youth brought up with me in the castle, Minette, whom I always knew to be a relative, yet saw treated with the disrespect shown to one in a degrading position; he was neither among the domestics, nor with their superiors. Emile was the illegitimate son of one of my father's cousins: he supported him from charity.

"Latterly, this young man had behaved to me in an extraordinary manner; indeed, his manner was changed to every one. It had become independent and overbearing; he had imbibed the principles of the revolution; he raved of liberty and equality. It was pride urged him on; he had secretly writhed under the odium affixed to his birth, and felt the degradation to which he appeared willingly to submit. He aspired now to be the equal of the heiress of the Comte de V—; in fact, he dared to declare to me his love; and, bolder still, to demand me from my father.

"I know not why I treated Emile with so much tenderness—gentleness, at least. I pitied him; I saw the cause of his error; I feared also to exasperate him, for I knew of his secret association with the revolutionists, and I trembled lest he might expose my dear father, who was an ultra-royalist, though he took no part in politics, to danger.

"My father, however, either did not share my apprehensions, or partook not in my cautious forbearance. Indignant at the presumption of the abandoned youth he had protected, he drove him from his presence with reproaches.

"Emile left the château to return no more.

"Henri de Renzi, who was then with his regiment at Strasburg, had never had my father's positive sanction, until the conduct of Emile, and his undisguised threats of yet having power to effect his purposes, led him to reflect on what might possibly become my position if he were to fall a victim to the ruthless spirit of the time.

"His own pure and noble character, his retiring and benevolent disposition, would be no counterbalance to his firm loyalist principles, and attachment to his king and the unfortunate queen.

"Perhaps it was a presentiment that I did not then penetrate, a desire to provide for my safety, which led him to favor De Renzi, who, though a royalist himself in principle, had powerful friends among the opposite party. Finally, he sent for him, and presented him to me as my husband.

"Ah, Minette! that was a joyful surprise to both. The time that was to intervene before our marriage was short, and busily occupied. I saw my father grave—sad—often lost in painful thoughts; but we were so happy, we did not always think even of the horrors that were being perpetrated in our land.

"I saw even Henri look at times anxious, yet I never noticed the storm that was then lowering

over our heads. Our wedding-day was fixed. Previous to its dawn, the Tree of Liberty, which had been erected in the village, was cut down in the night, no one knew by whom.

"It was evening: we stood before the altar. Minette, I see now the red light from that old stained window in our chapel falling full upon my father's noble head!"

"She raised herself on her elbow, and looked up to the skylight of the loft. 'Oh, Father of Heaven!' she cried, and dropped back again; her long hair fell over her face, and hid its emotion.

"I raised her head, and saw that emotion was not expressed there; it was almost calm. She looked at me silently for some time, and then, holding up the third finger of her left hand, she said—

"See, Minette, it is not here!"

"The ring, mademoiselle!"

"Yes, the ring," she repeated; and, with a shudder, the hand fell down.

"You had better tell me no more, mademoiselle; I can guess the rest. You were a widow before you were a wife!"

"No, no, you are wrong!—God grant you may be wrong! Listen now, I can go on. My father had bestowed this hand, he had given it to Henri de Renzi; the ring that was to bind me to him forever was already half-way on this finger, there was a cry in the open air—a cry at the chapel-door—a cry behind us in the aisle! The priest stood still, with terror staring in his eyes: a villager, streaming with blood, staggered towards us; he uttered the words, 'Save yourselves!' and fell. My father, with a face of death, yet composed and ever noble in aspect, caught me to his breast, pressed me to the heart where life had nearly ceased to beat, bent his knee before our bridal altar, and said—

"God preserve—preserve my child, and receive me to thine eternal mercy!"

"The next instant the chapel was full of bloody men. Alas! alas! that good old priest!"

"There was a long silence. The poor young countess, however, resumed her fearful story, as if unconscious that she had paused.

"I was in white, Minette; the veil was on my head, and the orange-wreath in my hair, but the ring had fallen from my finger. I was in Avignon instead of being in our own castle—instead of being in our own dear chapel. I did not see the priest, I did not see Henri; I saw my father—yes, I saw him but for a moment. I saw that countenance, pale yet firm—that noble head!"

"Mademoiselle, I can hear you no longer; this agitation must be fatal!—fatal, at least, to all your hopes of escape."

"Escape! Can that be! Is that my wish? Yes, escape or death!—but together. I will not distress you further, good Minette; you know enough now. The old palace of the popes at Avignon, its blood-stained tower, that was his scaffold and his tomb—of sixty more also, nobles of the land! Ah!" she exclaimed, with a frantic start, "they threw quicklime over them!" and a sort of muttering laugh, more terrible to hear than sighs or groans, burst from her dry and quivering lips.

"Anxious to divert so horrible a recollection, I asked her how she had escaped.

"I do not know," she answered—"I do not know why I was reserved, nor where they were

taking me, but I was on horseback, and a guard was holding my rein, when I began to recover my recollection. I believe we were on the road for Paris, but it seems as if I had been asleep. We passed a peasant, who uttered a salutation in the revolutionary fashion; I think his voice was the first thing I became sensible to. Perhaps there is some mystery even in human tones that exercises a power over the mind. At the door of a cabaret, my guard dismounted to get refreshment. He invited me to do so, and placed me on a chair which I caught hold of close to the door. Soon after, the countryman we had passed came in, and in passing me, while the loud discourse going on in the room prevented others from hearing him, he told me, in a low voice, not to dismount the next time. What voice was that which spoke to me? I did not know it, yet it was almost familiar. I resolved to do as I was desired. I became aroused to a sense of my situation; a keen, anxious longing for escape occupied my mind. Evening was closing in; the words said to me made me anxious for my conductor to halt again. At last he did so, and called for wine. I declined to get down, and at the moment the same peasant appeared, and asked to hold the horses. The man promised him some sous for doing so, and entered the cabaret.

"The countryman led both horses up and down, making each turn longer, until he saw no one near, and then he said—

"Courage, and you are saved! Keep your seat steadily."

"He sprang on the other horse, held the bridle of mine, and we went off with a speed that soon rendered me insensible. I was only conscious that we had turned into a bye-road, and after that I knew that I was held by my deliverer on the horse he rode.

"I opened my eyes sometimes, and saw the moon shining down upon us, but I could scarcely tell whether I were still in the land of violence, or had passed away into that of separated spirits, for all was dream-like and indistinct in my sensations. I awoke to find myself in a vaulted cavern, one of those rocky abodes frequented by the persecuted Albigenses, and later victims of tyranny in Provence.

"The sunlight scantily entered at the low door, shadowed by a mass of rock, and, just intercepting its ray, stood the form of the peasant who had snatched me, perhaps, from death. His side-face was before me, and I looked anxiously at it as on that of a stranger; but while doing so, he raised his hand and removed a great red beard and moustache, then drew from his head a wig of the same color, and showed me the dark face and well-known features of the recreant Emile.

"I uttered a low moan of anguish; my deliverance filled me with horror and dismay. He turned his head and saw me, half raised, regarding him with terrified and distended eyes. He came near to me; his voice, when he spoke, was low, but it was like the hushed breath of the whirlwind.

"Pauline," he said, "I did not mean you to know me until you knew that, so far as I could save you, you were safe. Read that."

"He put into my hand a small slip of paper; it was the writing of De Renzi. It said, 'Trust him, he repents; he will save your life at the expense of his own. If you are safe, send this ring by a

messenger I can trust.' There it is, Minette! that was given to me in the cavern; and there is the ring. See, it has a long lock of Henri's hair tied through it!

"I only said to Emile, 'Is he safe?'

"Who?" he demanded. 'Your father?' and his eyes rolled.

"No, my husband," I said, emphatically.

"Yes, I hope so," said Emile, calmly. "He has been sent back to his regiment only; if you have courage you may yet be united. Will you do as he says? Will you trust yourself to me?"

"I answered, 'Yes.'

"Emile went away without a word. He returned with some wine and fruit, made me take some refreshment, and when night fell, he came again, with a peasant's cloak, in which he wrapped me, and made me then lie down in a cart that was waiting for us. He drove it himself, disguised as a laborer. He only said—

"You must be my sick wife; I am bringing you to the hospital."

"Thus we made out our road to Marseilles. Wrapped in the peasant's mantle, with the hood over my head, I might have escaped detection even had the cart been examined; but Emile acted his part so well that not the least suspicion was even excited, and we reached this merchant's house, who was an old *protégé* of my father's, and known also to Emile.

"I want to die, Minette," the young countess concluded, "yet I want to live, for De Renzi is still alive—my husband!"

"And you will live for him, live with him, I hope—live to bless God!" I rejoined.

"The next day I engaged a *voiturier* for my Swiss lady and myself. I had my passport, and we managed without much difficulty to pass off the countess as the mistress I had come to bring back to Switzerland. I had provided her with a plain black dress and close cap, which concealed her beautiful hair, and made her look so pale and ill, that I had generally but little trouble in making her pass for an invalid, with whom the greatest caution and repose were requisite. At Lyons, notwithstanding, I was greatly alarmed at the manner of the *voiturier* who had brought us there; the tone in which he would repeat, 'This sick lady of yours,' terrified me.

"At Lyons he looked hardly at me, and after repeating this speech in his usual way—he was a handsome, sharp-looking young man—he demanded a kiss."

The Arab listener laughed.

"Well, you did not give it to the fellow?"

"I did, though," said the pretty old woman, very quietly, and with a careless smile. "I said, 'You are a brave *voiturier*—a brave man. I thank you for your goodness, and this kiss must be the pledge between us that if we want your services in future they will be rendered.'

"Brave girl!" he said, in answer; "and this kiss"—he had the complaisance to return the pledge—"is my promise that my service shall be rendered, and that on the spot. Listen, Minette—you are called Minette, they say. Well, I am your good friend; I do not want to be your lover, I hope you will have a better, but I am your friend. Take my counsel, and let me conduct you into Switzerland, there you can do as you like; till then you will be safe—safer," he added, emphatically, "with me."

"I gave him my hand, and said—

" 'There is my faith, come with us if you will.' "

"He conducted us safely to Switzerland.

Heaven bless that man! I never saw him more, but I remember his curling whiskers, and that keen eye, which said a giant could not drive but an infant might lead him. We came to Lausanne; the poor countess threw herself weeping into my arms. 'You are safe, dear Minette, I cannot wish you to be otherwise; you will leave me now.'

" 'No, mademoiselle, not till you also are safe,' I said.

"We disguised ourselves then as two peasants, and took the costume of Alsace. Mademoiselle looked beautiful, but it was too delicate a beauty to attract sudden notice from the rude people.

"She wore the short orange petticoat of the country, with black stockings and a black boddice; her head covered with the usual coiffure of orange riband, almost scarlet in color, very broad, with a large bow on the top. But she looked so pale and feeble, that those who were not near enough to see her lovely features, or meet the gaze of her earnest, deep blue eyes, which were almost always hidden beneath their deep eyelid, were little likely to notice her; and these rude people see beauty so differently from more refined minds! The soldiers let her pass with scarcely a glance; I, on the contrary, had more color than ever. I could not keep it down. I trembled, yet felt a kind of delight at the danger in which I had placed myself—one is so enthusiastic at seventeen! my eyes sparkled as if I were in joy. I dare not put the orange riband in my hair, I wore black, that looked more sober.

"We entered the gates of Strasburg carrying a basket on a market-day. Mademoiselle had kept the ring with the lock of hair tied to it; but when we were installed in a humble lodging she knew not how to send it to M. de Renzi with safety.

" 'Listen, mademoiselle,' I said. 'I shall go to the Place this evening; monsieur will be there, will he not?'

" 'Perhaps. But what then?'

" 'Give me his ring, and let us see what then.'

"She gave it; I went on the Place d'Armes. There was a multitude of *panaches*\* there. You may think—a girl of seventeen years, and I was pretty then, they said—very pretty. Well, the *panaches* were a little tiresome, but that was no matter when there was an end in view. But there was one who would not pay me any attention—a brave young officer, with the air of a lord and a look—ah! there was sorrow in it. I wanted him to notice me; but no, he could not spare me a glance.

"At last I accidentally caught his eye; he saw the ring hanging loosely on the point of my finger. I knew that I was right in my guess. His heart was beating more quickly than mine, and thus you see we were in correspondence in a single minute while utter strangers to one another. I was seated on a bench, and some minutes afterwards that gallant-looking young officer came and threw himself carelessly on the other end of it. Some of the *panaches* were looking on; but no matter, I managed to say the name of the street and number of the house, and the words, 'Your cousin Minette from the country, *en paysan*.'

"So in the evening a fine young countryman

came in a blouse and working-day dress to inquire for his cousin Mademoiselle Minette. No one in the world would have known him—at least, no one but the young countess. Oh, what a meeting was theirs! Well, it is strange now when I think of them and of myself, what time does, to be sure! I thought that poor young bride would have died on the spot, she lay like a broken lily in his arms, and never shed a tear or spoke a word.

"But when she regained a little strength she spoke so courageously—I could not have thought it. I had left them alone; but she came suddenly and called for me. She made me stay there, and then she said—

" 'Henri, this girl is our guardian angel. I tell you in her presence what I know her heart will approve. I will never be your wife in this land of blood. If you will forsake it—if you will fly with me to England, come. I will bear all, brave all; but never shall our children—' She buried her face in her hand, groaned, and was silent.

"Now what was to be done? Escape appeared almost impossible, and a stay in Strasburg was full of danger. My good fortune, however, did not forsake me; in fact, I had a mission to do, and mademoiselle was in some degree right when she said I was sent by her guardian angel; but certainly the instruments they employed for me were not always like the good angel's.

"There was always some one or other to take a fancy to me—not in the way of my poor Inclination, but some one, you know, who just liked bright eyes and pink cheeks, and so I was tormented by a horrible creature whom I hated in my heart. He was an agent of the revolution—pah! I always thought of a slaughter-house when he was near me."

"At least, you were not so complaisant with him as with your *voiturier*," said the Algerian.

"You would not bribe him with a kiss?"

"I gave him many, nevertheless," the pretty old woman replied. "Yes, those kisses were the worst part of my *rôle*—a token of love without love. Wasn't it hard! But no matter, I had a purpose to gain; what I wanted to steal was worth a kiss or two, though it is hard to be kissed by those we do not love."

"To steal! What was that?"

"His passport. He had shown it to me *tout en règle*. He expected to be sent to Nantes to execute a few thousand murders; it was made out for himself and suite, as he generally had some companions.

"As soon as I had got possession of this passport the young countess and I took a great bundle of clothes and left the town as two washerwomen. M. de Renzi went out for an evening ride and rode farther than he ought in duty to have done. A friend at some distance from the city provided him with a change of dress and other disguises. We were soon *en route*.

"A British ship-of-war was watching about for fugitives, and after some fearful hazards they got safe to it. The captain received them so well! All was over then; they would soon be in England, she would soon be his wife, and he would be an exile. I left them on the deck of the English ship."

The pretty old woman wiped a tear from her brilliant eyes.

"And they did not take you?" our Algerian ejaculated, gazing on the little old dame as if he could have verily taken her himself.

\* Officer's plumes.



"Take me! ah! the exiles!"

And the three notes of admiration were sufficiently explanatory of her brief reply.

"Well, you saved them?"

"Yes, I saved them; I thank God for that."

"And what did you do with yourself then?"

"I returned to Vevay. My poor father was glad; I made his latter days pass more pleasantly: he did not live long. My dear mother was then alone. I had loved her fondly. I lived for her then, and carried on for her my father's business. We were together some years. I had lovers enough—at least, more than I wanted; but I never loved any but my Inclination. He was heard of no more, so all I could do was to listen when they spoke of love, and to smile, and refuse to believe; and then they would call me a coquette, but I was not so; and they would leave me, and I would wish they had never come, for it caused them sorrow; and when another came it would be the same all over again."

"What a pity!" cried her listener.

"Well, but when my mother died it was different with me. The heart feels so strange when it has nothing to do! My hands and feet did not move so quickly then."

"And you never saw your heroine again, nor the hero you saved!"

"I did not say so. Yes, I saw them; it was in the year 1815. I was standing leaning over the half-door of my house—it was all my own then, a lonely one—the sun was going down behind the mountains at the other side the lake. There, I just see it now, and that golden path over the blue water, and the reddened snow on the mountains. I was looking at it; all this makes one think of times that are gone, where is the use of it! But just then crack comes the postilion's whip, sounding in the echoes of the hills, crack—crack—crack. 'Ah, here is more of them!' said the neighbors, and every one ran out to look, for a little time before we should have wondered less at the sound of cannon than at the noise of the postilion's whip. Every day now we saw travellers dashing along."

"But the carriage stopped, the postilion spoke to a man in the street, and then crack went the whip again, and it came on to my door. A fine youth was on the outside, and a lady and gentleman and some sweet little girls within. The lady I did not recognize; she was pale, and her brow had the marks of care. She had the face of one who had only just put on joy, and could not yet let it be much seen. And a grave, thoughtful man was beside her, who smiled, but like one to whom smiles were uncommon."

"The lady called out, 'There she is! it is she!' And the youth jumped down and opened the carriage-door with the air of one who knows he gives pleasure; and I ran out, and the lady spread out her arms, and cried 'Minette!' and the voice was the voice I had heard in the garret at Marseilles."

"And there was the countess weeping in my arms, and laying her two hands on my shoulders,

and pushing me back to look in my face, and then saying I was not old and worn with care like her, and then turning to smile on her husband, who kept pressing his youngest little boy into my arms and calling all the children to come and embrace the woman who had saved their parents and reunited them. And when I looked at her, then I saw it was indeed that lovely and terrified girl grown into a careful, anxious, yet still loving woman."

"The exiles' lot had been theirs, and they still wore the exiles' looks. And the neighbors all stood round and wondered, for they had never heard a word of my adventures."

"Well," said our fine gentleman, after a pause, and I almost thought he wiped a tear from his eye, "did your manner of life change then? They did something for you, did they not?"

"I wanted nothing to be done for me," the little old woman rather proudly answered. "They could not bring the dead to life. As to anything else I had more than I wanted. They wished me to go to live with them, for Monsieur de Renzi was to have his wife's property and to bear her murdered father's title, and all the children were made to beg me to go with them."

"But when they were gone I was more alone than ever. I had seen her with her husband and her children, and I often said to myself, 'The woman that does not provide a home for her heart is a fool.' Certainly I had been robbed of mine; but now I began to feel that anything was better than to live solely for oneself. I told you that the old widower my father wanted me to marry, had a son a good many years older than myself. He had married, and his wife died, and left two sweet children, whom I loved fondly. They were almost always with me; they loved me, and I could not do without them. The father told me he would marry again, and I could not bear to think that those children might have a step-mother who would not make them happy. Perhaps this was only a trick of his—I do not know; but when he saw my anxiety he persuaded me it was better to prevent the danger and be the step-mother myself. It was for the children's sake I did it; but I certainly did not feel so desirous to save them from a cruel step-mother until after I had seen the countess and her happy family. Besides, he declared I had been his first love, and there is a great deal in that, especially when the man is a widower. So, very soon after the exiles had passed through Vevay on their return home I married the father of those children, and they are content with their step-mother."

"And there—there—there!" cried the pretty old woman, tugging a great wicker-basket from under the seat, "there is my house, and there are the children looking for me! Stop, stop, conducteur! this is Vevay. What nonsense to write up on that post 'The road for Italy!' Bon jour, mes amis! bon jour! Ah, I forgot to tell you in my story that the revolutionists guillotined their friend Monsieur Emile. Bon jour! bon jour!"

From Fraser's Magazine.

THE "ECRIVAIN PUBLIC." A SKETCH FROM  
PARISIAN LIFE.

## CHAPTER I.—A MISTRESS.

Who has resided in Paris for any length of time without becoming acquainted, at least by sight, with some of those humble temples of literature which abound in that city, resembling cobblers' stalls, kept by the very poorest of the brethren of the quill, who announce their calling to the world by the somewhat magniloquent title, inscribed on their little bricks, of "Ecrivains Publics!" How many a tale of love in humble life, how many an intrigue, how many a reputation, lie at the mercy of these humble and busily employed agents of illiterate Paris! They are said to be a class of men who, though steeped to the lips in poverty, invariably display the most scrupulous integrity and discretion towards their employers; and, according to general report, the confessionals of St. Roch or Notre Dame de Lorette are not more sacred than the secrets confided to the penmanship of these miserable scribes. Their *boutiques* are usually found in retired parts of the town, where a spot of waste ground, or a friendly gable of a house, affords space for their erection, without the awkwardness of a demand for rent. A description of this class of the sons of literature, so totally unknown to fame, would be worthy the pen of the Fielding of former days, or the Charles Dickens of our own. But, as we, alas! have no skill in this admirable species of portraiture, we propose to lay before the reader a romance of modern Paris, an "over true tale," in which one of these worthy public *littérateurs* enacted a not undistinguished part, and one which amply bears out the high character for integrity and honor ascribed to the brotherhood.

The reader must accompany us to a small apartment on a second floor, in a retired, quiet street, situated in the most aristocratic quarter of Paris, the Faubourg St. Germain. Though small, the rooms were neat in the extreme; and while nothing that could properly be called luxury was visible, except one of Erard's grand pianos may be thus denominated, the presence of a presiding taste was everywhere apparent, and threw a certain air of unpretending elegance over the modest sojourn.

A young lady was seated near the window busily employed at her embroidery-frame. Her eyes were steadily and earnestly bent upon her work; occasionally she raised her long dark eye-lashes to the timepiece which stood on the mantel-shelf, the hands of which seemed to move too rapidly for her wishes. Her dress was simple and becoming, but had it been directly otherwise, no style of dress could conceal the captivating beauty of her form and features. The former was exactly of that character which a painter would most prize as a model of feminine grace and elegant proportions; and her countenance, beaming with intelligence and feeling, was a living portrait of some of those immortal creations with which the pencil of Raffaele has enchanted the world.

At length she raised her head, and regarded the clock with an air of satisfaction. Her work was completed. She rose and rang the bell. An old servant appeared.

"Marian," said her mistress, in a tone which showed her satisfaction, "it is finished. Look! What do you think of it?"

Marian, having put on her spectacles with the

air of a grand judge, proceeded to examine the work.

"Ah," said she, "how beautiful! What colors! Only let me dispose of it, and I'll get you a far better price than you were paid for the last."

"You know very well," replied her mistress, "that it is already sold to the same house, and the price agreed upon."

"The Jews!" muttered Marian.

"Nay, Marian," said her mistress, "you must not forget that these good people have given me constant employment, and so saved us much trouble."

"Ah!" returned the servant, in a tone of impatience, "you could have done without them if you would but have spoken one word."

A look of some severity from her mistress cut short the further loquacity of Marian, who with some embarrassment added,—

"I meant, by your teaching the piano, *dame!* at ten francs a lesson!"

"You know it displeased M. Alfred."

"That is true enough; and after all I like this better than your teaching—obliged to be abroad in all sorts of weather, and coming home sometimes so harassed and fatigued. At present you never go out at all, except when M. De Monville gives you his arm, and that is not too often."

Another look from her mistress again arrested the garrulity of the old servant, which, be it observed, was seldom without a slight infusion of malice. While she had been speaking, the former detached her work from the frame, and carefully rolling it up,—

"Here," said she, "go with this at once before M. Alfred arrives; it is now near his hour. Put this frame also out of the way that he may not see it."

"Take care, take care," said the old woman; "you know how he hates mystery."

"Alas! Heaven knows how it pains me to conceal anything from him. But this—" She made a sign, and Marian took the things and went out, leaving her mistress plunged in melancholy reflection; for this brief conversation had brought her situation—the present and the future—sadly and painfully before her.

Louisa Chatenay was but three years old when she experienced the loss, always deplorable, of her mother. Her father, a highly learned and esteemed professor in a provincial town, had spared neither care nor cost on her education; and his best and most distinguished pupil was his darling Louisa.

To a singular aptitude for all kinds of elegant literature, he saw that she added a decided taste for music. Instructors were procured, and her progress was even more rapid in this most fascinating of the sciences than in the other branches of her education, as though there existed some hidden sympathy between the enchanting art and the soul of the fair musician, now become a charming girl of sixteen. Her playing seemed less execution than inspiration; and though unequal to the tremendous crashes of the modern tornado school, which makes one feel even for the unfortunate instrument, her facile comprehension of the great masters appeared rather divination than study. Her voice, too, was magnificent, a rich mezzo soprano, which thrilled in the solemn strains of the divine Pergolèse, or the touching melodies of the too-early-lost Bellini, (for her exalted admiration of the master-spirits of the times gone by did not render her insensible to the beauties of the moderns—so ignorant was Louisa of the rules

laid down by modern criticism.) At this period Louisa was, both in mind and person, everything that the fondest father could desire; and though she, perhaps, enjoyed a greater share of liberty than a mother's anxious vigilance would have allowed, her natural prudence and a sensitive delicacy of character supplied the want of experience.

Among the more intimate friends of her father was a family named Preville; the children had been infant playfellows, and their friendship afterwards continued without interruption. During the age of childhood a marriage had even been talked of between the little Louisa and the elder boy, Julian Preville; and although no mention had been made of this project of late years, the parents on both sides, particularly the father of Louisa, looked forward to it as an event which, though not certain, might be regarded as far from improbable. The boy, who was some two or three years elder than Louisa, was, perhaps, even more sanguine in his hopes.

These hopes, however, if he really entertained them, were neither shared nor thought of by Louisa. Whether it was that the hour of her heart's awakening had not yet come, or from whatever other cause, she continued to regard Julian with the kindness due to the friend of her childhood, but without a ray of warmer feeling; and her life glided on peacefully and tranquilly until her eighteenth year. She was now struck with a dreadful calamity—the death of her father.

He died suddenly, leaving no fortune. Louisa would have been nearly a beggar, but for a trifling income derived from her mother. Julian Preville, now engaged in commercial pursuits, was absent at the time; his family learning the extent of Louisa's poverty, prudently evinced no desire to renew the recollection of the formerly projected marriage; and with the advice of her friends she determined upon proceeding to Paris, where she had an old relative, the only one left her in the world, but the amount of whose assistance on her arrival was, counselling her to employ the little money she had remaining in perfecting her talents, and to receive lessons before commencing to give them.

Louisa, however, soon succeeded in procuring a few pupils, and her talents were already securing for the friendless girl a modest independence, when, at the residence of a family of rank in which she gave lessons in music, she met M. Alfred de Monville—an event which materially affected the color of her future life. Without entering into details of the growth of their acquaintance, it is only necessary here to state, that, struck by her uncommon beauty, he became an assiduous and devoted admirer, and that the passion thus commenced was daily augmented by a further knowledge of her mind and character. He was also a passionate lover of music, and this led to a dangerous intimacy between them. His assiduities and devotedness made an impression upon her heart; and, not unnecessarily to prolong our narrative, Louisa for the first time felt the loss—the irreparable loss of a mother.

Six months had passed; and although the affection of Alfred seemed constantly to increase, during his absence a corroding sentiment of sorrow and remorse would frequently intrude. Her sole happiness rested upon the continuance of his love, and she knew that his family were unceasingly urging him to a union with a young lady of rank and fortune. Louisa had other motives for uneasiness—in the character of her lover himself. With a tenderness and depth of affection, almost without

example, mixed with great nobleness of mind, he displayed some defects which she could not regard without inquietude. Of these, jealousy and a proneness to suspicion were the principal. On this account she had long since given up her music-lessons, for he had, with some justice, objections to a profession which led her so much into public without adequate protection. But in sacrificing this source of income, Louisa would accept of nothing in return from her lover, giving him to understand that the small succession left her at the death of her father was sufficient for her wants. We have seen how the deficiency was supplied.

The servant had not left the house many minutes, when Louisa was roused from her reverie by the ringing of the bell. "Marian went in time," mentally exclaimed she, as she hastened to open the door.

M. de Monville entered. He was a young man of dark complexion, tall and well-made, apparently about thirty years of age. His manner and appearance bore that unmistakable impress of high life which is, perhaps, never to be imitated with success. Habits of serious study had imprinted something of precocious gravity upon his features; and though naturally kind and indulgent, the expression of his dark and piercing eye denoted the suspicious, or, at least, highly impressionable disposition to which we have already alluded, and which is not altogether unfrequent with those who have passed more of their time in company with books than with the world.

De Monville looked round on entering, and inquired for Marian.

"I have just sent her out," said Louisa, without further explanation.

"I am glad we are alone," rejoined Alfred. He entered the little saloon, and taking both the hands of Louisa in his own, he imprinted a tender kiss on her forehead. There was something in his manner which seemed to indicate that he had something of importance to communicate; and in the course of a long and interesting conversation between the lovers, which we generously spare the reader, he acquainted her that the constant importunities of his mother and friends on the subject of his marriage had at length forced him to come to a determination.

"Well!" said Louisa, turning rather pale.

"Well," continued he, "I have chosen a wife. I have not sought her among those who, gifted with birth and fortune, conceive that they can dispense with the amiable virtues and acquirements which to my mind constitute the real ornaments of life. I have found one, kind, modest, gifted, and loving—one whose heart has made sacrifices for me, which a life of devotedness only can repay. Louisa, will you accept my hand and name?"

Is it necessary to state the reply of Louisa? The noble and generous offer which comprised in her eyes not only happiness, but the establishment of honor and reputation, was received with tears of love and gratitude.

A long conversation followed, chiefly upon their future arrangements; in the course of which Alfred entreated her to give him a small gold ring which Louisa's mother had tied round her neck with her dying blessing, praying Heaven that it might be as a talisman to shield her child from evil. This gift Louisa had guarded with religious love and reverence. Alfred had before frequently solicited it in vain. He now claimed it in the right of her future husband.

Louisa promised that it should be her wedding-



gift to him. He was fain to be satisfied with this promise, for before he could reply to it the entrance of Marian put a stop to their further discourse.

The old servant was evidently in a very bad humor. She made signs to her mistress that she had not found the shopkeeper at home, and that she had brought back the embroidery unsold.

Alfred perceived some of this dumb show, and inquired what it meant.

"Nothing," said Louisa, with a smile.

"Always mysterious!" returned Alfred, taking his hat, half angrily.

"No," said Louisa, arresting his ill-humor with a kiss.

Alfred was satisfied—or nearly so, and tenderly took his leave.

#### CHAPTER II.—OBSTACLES.

DURING the hours which the lovers were passing so happily together, a scene was proceeding in a neighboring street at the Hôtel de Monville, Rue de Grenelle, the *dénouement* of which, if realized, promised effectually to interfere with their plans. The mother of Alfred was at that time receiving the formal—nay, almost solemn visit of the Countess de Châteauneuf, a lady immensely rich, of the ancient noblesse, and influentially connected with the highest personages of the court. The countess had an only daughter, and hence her present visit to Madame de Monville. The negotiations had been going on for some time; the present interview was long, and the ladies, in separating, had lost something of the stiff and ceremonious dignity which marked their meeting. The two mothers had agreed to the marriage of Alfred and Mdlle. de Châteauneuf.

Madame de Châteauneuf had scarcely quitted the drawing-room, attended by her hostess, at one door, when a personage of some consequence in our story entered by another. This was a lady, who had probably reached her twenty-sixth year, but whose features still retained the charm and freshness of youth. The expression of her countenance was replete with winning modesty and in harmony with all her movements, which were marked by serene gentleness and grace. The beauty of Madame Valmont was not of that description which captivates at first sight, but it stole upon the heart, and left an indelible impression. A slightly brown complexion, as if colored under the sunny skies of Italy, was contrasted by her deep blue eyes and fair hair—peculiarities which not unfrequently mark an organization uniting two opposite natures, the deep passions of the South with the voluptuous languor of the East. This charming person, notwithstanding all her external advantages, was far from happy. Married by her parents at an early age to M. Valmont, a man more than double her years, she had never known the felicity of mutual affection, nor even the tranquil comforts of ordinary wedded life. Her husband was a man without either vices or virtues properly so called. His mind was too much absorbed in commercial or other speculations to appreciate or even to think of his wife.

Any novel mercantile scheme, or extraordinary invention, particularly if there appeared anything very impracticable about them, was certain to find in M. Valmont an active and zealous patron. But the numerous undertakings he had taken up had never but one result—failure. At last, nearly ruined, but still as sanguine as ever, he embarked the residue of a once large fortune in a miscellaneous cargo, with which he freighted a vessel for

the antipodes. A newly invented soap, and some thousand cases of eau de Cologne, formed a large portion of his cargo, upon the sale of which he calculated upon realizing at least 500 per cent. in Australia, and thus being enabled to reconstruct his shattered fortunes. To direct so important an operation he had himself embarked for New South Wales, leaving Madame Valmont behind him in France, in possession of so much of her fortune as he had been by law unable to touch.

The mother of Alfred, who was a distant relative and had always been much attached to Madame Valmont, invited her to take up her abode in her hôtel during her temporary widowhood—an offer which Madame Valmont gratefully accepted, as affording her not only a home and society, but the kind of protection which is necessary to a young woman in a position of some difficulty as well as delicacy.

Matilda Valmont had now been several months a member of the family, during which time her amiable character had ingratiated her into the most intimate confidence of Madame de Monville and Alfred. Indeed, had the heart of the latter not been entirely absorbed by his passion for Louisa, he might have found himself in dangerous proximity with his beautiful cousin.

Madame Valmont stood for a few moments after entering the room plunged in deep thought; but her countenance brightened on the reëtrance of Madame de Monville, who returned accompanied by another friend of the family—a M. St. George. This gentleman appeared some forty years old. He had quitted the army to become partner in a Paris banking-house, of which one of his friends was at the head, and without remarkable talents of any kind, M. St. George before long found himself master of a considerable fortune, the acquirement of which, after the manner of most successful adventurers, he attributed solely to his own excessive cleverness. Without possessing the manners, and still less the feelings, of a gentleman—for the French army, whatever be its other merits, is decidedly the worst school in the world for that species of knowledge—his military habits had given him a certain frankness, which found favor in many of the aristocratic saloons of the Faubourg St. Germain; and, perfectly alive to the advantages of such a connection, the ex-captain assiduously cultivated the good graces of the noble owners. In this he succeeded so well, particularly where the reigning powers happened to be vested in the hands of elderly ladies, that M. St. George was in certain families of distinction the chosen counsellor, friend, and agent in all cases of difficulty. He had been apparently sent for on the present occasion by Madame de Monville to be consulted upon some affair of importance, for the old lady told Matilda that she had to speak to him on particular business.

"You wish to be alone? I will leave you," said Matilda, rising.

"Order the carriage, my dear, and drive to the Champs Elysées. The day is beautiful, and it will do you good. You are looking a little pale." Madame de Monville, as she spoke, pressed the hands of Matilda affectionately. "By the way," she added, "you received letters with news of M. Valmont last night; I have not seen you since. I hope it was satisfactory—he is well!"

"Quite," returned Madame Valmont with a slight alteration of voice—"quite well. Thanks, dear madam, for the interest you take in all that concerns me. Perfectly satisfactory."

With an amicable salutation to St. George, Matilda retired to her apartment.

She had no sooner quitted the room, than Madame de Monville acquainted her confidant that she had concluded the arrangements for the marriage of Mademoiselle de Châteauneuf and her son. St. George was proceeding to congratulate her upon this splendid alliance, when she informed him that she had discovered the existence of a serious obstacle; one which, she feared, from the character of Alfred would be almost insurmountable.

This obstacle was her son's passion for Louisa, with which Madame de Monville appeared acquainted.

St. George treated it lightly, as an attachment natural at the age of Alfred, but which he had too much good sense to permit to stand in the way of an advantageous marriage. He would see the person in question himself—a milliner! a *danseuse*!

"Neither," said Madame de Monville. "I hear she is of honest parents, and has received a distinguished education. Of course, a creature without morals."

St. George readily assented to this conclusion.

"I will explain matters frankly to her," continued he. "Persons of this class don't want discernment. Alfred is rich, the thing must be done handsomely. A present of £500, perhaps much less, will remove every difficulty. Make yourself perfectly easy. I'll answer for settling the affair. Where does she live?"

"In the Rue St. Romain, near this."

"I'll see her at once," said St. George, rising and taking his hat.

Madame de Monville, however, advised him first to see her son on the subject; as, if he were really so attached to his mistress as represented to her, he would be disposed to resent any interference of which she might complain to him, and as in that case she would, doubtless, represent everything that was said so as to suit her own views, it would be better to apply to her only as a last resort, should Alfred be inflexible. For herself, Madame de Monville confessed her reluctance to enter upon the subject with her son, knowing the determination with which he adhered to any resolution once taken, and doubting her own firmness, from knowing the influence he had over her mind.

St. George at once set about the task he had thus undertaken, for, be it observed, he was never so much at home as when meddling with the affairs of others. His interference, as might be anticipated, was very ill received by the young man. St. George, however, had no superfluous delicacy to be wounded, and returned to the charge with such boldness and pertinacity that, after several warm discussions, a serious quarrel was nearly occurring between them in consequence of his speaking of Louisa in a tone which might be expected from his principles, but which M. de Monville warmly resented. St. George, however, wisely considered that, though an ally of the mother, it was no part of his mission to fight a duel with the son; he, therefore, resolved to change his tactics and appeal, as he originally intended, to Louisa herself.

In the mean time Alfred was wearied and annoyed by these discussions, and still more by the change of manner of his mother, to whom he was affectionately attached, and who, while she forebore to urge him on the subject of Mademoiselle de Châteauneuf, omitted no occasion of showing how earnestly she desired his marriage with that lady.

The time he passed at home would have flown heavily indeed had it not been that he had there one friend, his kind cousin Madame Valmont, to whom he could confide all his annoyances, all his hopes; his love for his Louisa, their intended union—all was confided to her friendly ear. She used to question him on the beauty and accomplishments of his future wife, and charmed him by listening to his delighted descriptions until she appeared nearly as much in love with her as Alfred himself.

But before these anticipations could be realized, a grand obstacle had to be removed—the terrible marriage with Mademoiselle de Châteauneuf, which his mother had so near at heart. The negotiations were silently proceeding, and the day next but one was fixed upon for the formal introduction of the two families at a grand dinner, given by Madame de Monville. Alfred owned his perplexity to his cousin. The union was impossible, yet he shrank from acquainting his mother with his refusal, which he knew would so seriously grieve her.

"There is a good angel who watches over true love," smilingly observed Madame Valmont. "Who knows, perhaps an objection may come from the other side! Hope!"

The day following Alfred was greatly surprised to learn from his mother that she had received an excuse from Madame de Châteauneuf, who could not dine with them as had been arranged. She was suddenly about to quit Paris with her daughter for a short time. No further explanation was given, but the chagrin and disappointment visible in her countenance showed that something had taken place to affect the threatened matrimonial project. Madame de Monville left the room to write a note, requesting to see M. St. George.

"My dear cousin," said Alfred to Madame Valmont, joyously, "this looks like a rupture. Is it one?"

"I hope so," returned Matilda.

"The 'good angel' that watches over true love is then yourself?"

"Silence!" said Matilda, "silence!"

"But how has it occurred? Tell me, dear cousin, that I may thank you—that I may —"

"Hush!" interrupted Madame Valmont, in a low voice. "What I have done is nothing. I saw you unhappy, and this is my sole excuse. Go, think only now of your Louisa. Marry her, as she is worthy of your heart. Adieu! in a short time your mother will yield to your prayers and forgive you. Farewell!"

In order to keep aloof from the little family discussions which were now likely to occur, Matilda accepted an invitation to pass a few days with a friend in the vicinity of Paris.

Nothing further was said of the marriage with Mademoiselle de Châteauneuf. Yet Alfred could not obtain the consent of his mother to his union with Louisa. When she appeared disposed to yield, St. George, who seemed to consider that his credit as a man of business would be compromised were this marriage to take place, reproached her with weakness. At length, however, she did yield a reluctant assent; but on condition that she should not be asked to see her daughter-in-law. With this De Monville was fain to be content for the present, relying upon the good offices of his gentle cousin, and upon that great softener of all asperities—Time, for a reconciliation at some future period.

Alfred possessed in his own right a small property, delightfully situated about twenty leagues from Paris. It was arranged that the marriage should

take place there, in order to avoid all unnecessary publicity. As the château had not been inhabited for some years, it was requisite to put it into a state fit to receive its new mistress; and for this purpose Alfred determined to proceed thither to superintend in person the alterations and repairs. He was to be absent a week, and to return two days previous to the celebration of the marriage. It was the first separation of the lovers, and, brief as it was to be, they parted with ominous grief—many tears on one side, deep sadness on both.

M. St. George resolved to take advantage of his absence and make a last effort to put a stop to the marriage. He accordingly saw Louisa two or three times.

On the return of Alfred to town he descended at his mother's hôtel previous to hastening to Louisa. The concierge handed him a letter—it was anonymous! What this letter contained will be seen in the following pages.

#### CHAPTER III.—THE LETTER.

The eight long days of absence had expired. Louisa was anxiously expecting De Monville when she was startled by a violent ringing at the bell.

"'Tis he!" cried Louisa, joyously flying towards the door, "'tis he!"

De Monville entered.

Louisa's joy was short-lived. He was no longer the same being. His face was deadly pale, and she could only gaze on him in silence. Without a word, he entered and closed the door behind him. With hasty strides he entered the inner room. She followed him.

His penetrating glance seemed to dive into the deepest recesses of her heart. One of his hands, placed under his cloak, was agitated by a convulsive motion; with the other he seized Louisa's arm and forced her to remain near him. His look, his silence, were dreadful.

"Heavens!" cried she, "what is the matter? You terrify me!"

"Be seated," returned he.

She sat down at once, awed by his tone and gesture.

De Monville endeavored to surmount the emotion he was laboring under. He remained silent for a few seconds, as if enjoying the increasing agitation of Louisa, and then, without taking his eyes from her face, he exclaimed—

"And so you have deceived me!"

The poor girl drew back in stupor. It was now her turn to gaze in silence, to feel her words expire on her lips. De Monville, who still held her arm, shook her roughly, and, in accents of fury, exclaimed—

"Answer, answer me, I say."

But it was in vain he tried to awaken her from the horrid trance. She did not reply, for the thought that he could believe her guilty had never entered her mind. All her fears were realized; the recollection of the intrigues, the manoeuvres she had so dreaded, assailed her at once. The horrible suspicion darted across her mind that Alfred no longer loved her—that, vanquished by the importunities of his family, he sought but a pretext to break off his engagements with her. An abyss had opened under her feet, and she had sunk into it.

De Monville, astonished at his easy triumph, again endeavored to restrain his feelings.

"I will be calm," said he. "Listen to me. This interview is most probably our last. If you

cannot justify yourself it will lead to an eternal separation. But I will not judge without hearing you. If you have deceived me, Louisa, you are very guilty, for I had placed boundless confidence in you. I should have blushed to set a spy over your actions. I loved you, and would have sacrificed all for you—family, friends, all."

She moved; she understood at last that he accused her of perfidy, of infamy. A flush of indignation covered her face and forehead, and when Alfred's glance again demanded an answer, it was met by a look of pride, but with the calmness of death.

A fresh pause ensued. Alfred continued.

"Speak candidly Louisa. Am I the only man who has entered this apartment since my departure?"

"Ah! is that all!" said she, coldly. "Yes, a friend of yours—M St. George."

"St. George!" exclaimed Alfred, surprised.

"Yes; he endeavored by his counsels and persuasions to prepare me for the meeting of to-day."

"He shall explain his conduct. But I do not mean him; you do not mention another, a young man, whose mysterious visits have been made known to me."

"Indeed!" said Louisa, recollecting a circumstance she had forgotten. "What have you been told?"

"What have I been told?" cried De Monville, crumpling in his rage a paper he had just drawn from his breast. "I have been told that the night before last a young man, muffled up in a cloak, secretly visited you, introduced by your servant; that he remained with you two hours; that he had before paid you similar visits, though you never spoke to me respecting him, or mentioned his name; in a word, that he knew you before I did, that he loved you, that you were to have been his wife. Is it true! Must I name him?"

"It is needless," said Louisa, coldly and haughtily. "Who gave you these particulars?"

"This letter," said Alfred. "Can you deny its contents?"

"By whom is it written?"

"It has no signature; but that is of no consequence if its contents be true."

"An anonymous letter!" replied Louisa, with a contemptuous smile. "You believe an anonymous letter! A dastardly denunciation is stronger in your mind than all the proofs I have given you of my affection! You esteem me so highly that the first slanderer who chooses to blacken me in your eyes is believed without even being obliged to verify his calumny by his name! Ah! what will be our future life?"

"Instead of accusing others defend yourself. If the author of this letter is a calumniator, I'll discover him; and, by Heaven! I'll punish him. But if he have only opened my eyes to your falsehood—if he prove me to be the victim of your perfidy, I am his debtor for more than life. Listen, and tell me which of these titles he deserves."

Then unfolding the paper, he read, in a voice nearly stifled by agitation, as follows:—

"Sir,—A person who takes an interest in your honor deems it a duty to assume the veil of an anonymous friend to acquaint you with the character of the woman who is soon to receive your name. I know not if you be the first in her affections, but you are not the first who was to have led her to the altar. A young man, named Preville, whom she



has known from her childhood, was to have married her; but this match was far from being so advantageous as that offered her by your love. She has, therefore, broken off with him, although she still continues to receive his visits. As, however, they must now separate, she saw him the evening before last to bid him adieu. Your absence from Paris favored this rendezvous, which lasted for two hours. He then quitted her, as he had arrived, taking the utmost precaution to avoid discovery."

"Can it be possible!" exclaimed Louisa. "What a web of falsehood! M. Preville——"

"Ah!" cried De Monville, "you acknowledge he has been here!"

"Yes! but hear me in your turn."

"No! I have heard enough—too much," said De Monville, in a voice of mingled fury and despair.

"Listen to me Alfred. Do not accuse me without allowing me to answer. I am innocent. My only error is to have made a secret of his visits. I did so partly because I dreaded your jealous suspicions, but chiefly because I held them of so little consequence as not to be worth remembering or naming. Yes, it is true that, almost in childhood, our families being neighbors and friends, in Providence, a union was talked of between us. But I never entertained a feeling towards him beyond the coldest indifference; and, grown up, the project, if ever really contemplated, was no longer thought of. Since I have been in Paris, business has two or three times led M. Preville to town, and he never failed to bring me tidings of my old friends. The day before yesterday he again returned, and it is true that he called in the evening, and true that he remained some time, for I had much to tell. I concealed nothing, neither my love for you, nor your generous conduct, nor our approaching union. As to the precautions he is said to have used, I know nothing of them. His visit was of no importance; I did not expect it, and if I did not mention it, it was because it had escaped my memory."

De Monville's suspicions were shaken by this simple recital. As she spoke he became less agitated and began to feel ashamed of his credulity. Half convinced of his error, he was ready to fall down at her feet and supplicate the pardon of the woman he adored, when his eye fell upon the latter part of the letter, which he had not read. He hesitated and determined to make a last trial.

"Pardon me, dearest," said he, "if I have suspected you unjustly. The excess of my love renders me distrustful. Besides, the secrets you confess to have concealed from me must serve to excuse my first transports. Can you forgive me?"

She placed one of her hands on her heart, and offered him the other. He covered it with kisses.

"Ah!" said she, "Alfred, how you have grieved me! I did not think it possible to suffer so much and live."

"And now, dearest," said De Monville, "as a pledge of our reconciliation, give me that ring you have so often refused me—your mother's ring. The more your heart values the gift, the dearer will the sacrifice be to me."

She replied, smiling, "Why this new desire! What value can it have in your eyes?"

"Does it not contain my Louisa's hair, cut from her forehead when she was a child! Do not refuse me. Give it me, I conjure you! I know where you keep it; in a small box in your secretary. Give me the key!"

His looks were tender and caressing, but his

voice trembled with a strange emotion. Louisa remarked it.

"Ah!" said she, "is it thus you sue for pardon?"

"I will have it!" cried De Monville, giving vent to the passion he had hitherto suppressed with a struggle; "I'll take it by force!"

"Still suspicious!"

"Still mysterious!"

"Well, sir, I will explain all. If I have refused till now to allow you to open my secretary, it is because it contains papers which would have let you see that, unable to live on my small income, as you imagined, I have supported myself on the produce of my labor. I did not acquaint you with this, because I was too proud to receive your gifts. Was it a crime?"

De Monville heard her; he wished to believe what she said; but, like a fatal poison, the letter burned his hands. He resumed, with a bitter smile,—

"And thus you have again deceived me?"

He snatched the key from her hand. Stupified at his violence, she sunk half fainting in a chair.

De Monville opened the secretary, searched—seized the box—opened it—the ring was gone!

"Ah!" cried he, casting on her a look of concentrated fury, "I knew it!"

At these words Louisa rose, ran to the secretary, and searched in vain for her ring.

"My ring!" she exclaimed. "Where is it! Where is my ring!"

"Gone!"

"Stolen, stolen!"

"Yes, stolen," said Alfred. Then taking her rudely by the arm he read aloud from the letter,—

"The proof that all ties are not broken off between this woman and her former lover—a proof that they still love each other—is, that she made him a present of a ring, a family ring, given her by her mother, enclosing some of her own hair."

"Now," cried De Monville, "can you deny it! You refused to give me the ring, you refused to give me the key. Falsehood upon falsehood, infamy upon infamy!"

In a frantic voice she called her servant, "My ring, Marian! where is my ring? What have you done with my ring?"

"You know Marian is not here," said De Monville, with a smile of scornful bitterness. "Farewell, madam; tell your lover he can return."

Louisa had fallen senseless on the ground. De Monville cast a last look at her as she lay, pale and motionless. He took a few steps towards her; but indignation arrested this movement of returning tenderness.

He threw a purse of gold upon the table and disappeared.

#### CHAPTER IV.—THE "ECRIVAIN PUBLIC."

Eighteen months after the terrible scene we have just narrated, we find De Monville seated in his study in the Rue de Grenelle. He had grown pale and much thinner, and appeared several years older than at that period. He was married. Madame Valmont, his cousin, of whose estimable qualities we have before spoken, had become his wife. A few words are necessary to explain this change in the situation of the two relatives towards each other.

After De Monville's rupture with Louisa a vic-

lent fever had for some time endangered his life. He must have died had it not been for the tender and unremitting care of his mother and his gentle cousin. And on his recovery, though broken in spirit, gratitude and friendship bound him to existence, for their sakes more than for his own. But the deepest melancholy succeeded the exhaustion of his fever. He allowed himself to be transported to the country, agreeably to the advice of his physicians, who hoped that a purer air would restore his sunken energies, and a change of objects aid in obliterating the impressions of the past.

His mother and Madame Valmont accompanied him to a fine old château they possessed down in Touraine. They had some intention of getting M. St. George to bear them company; but though Alfred, morally convinced that he had written the anonymous letter, was grateful to him for having opened his eyes, still he felt his presence oppressively painful. Whatever recalled the perfidy of her he had loved excited in his mind the most uncontrollable emotions. He even cherished a hope that she would write to him and justify herself. But he never heard of her since the moment of their parting. Ashamed of his weakness, he never suffered himself to breathe her name, and those around him were of course silent on the subject. It was in this state he left town, concealing from all the passion which was preying on his peace—too deeply wronged to think of a reconciliation, and yet too loving to seek consolation by imparting the source of his distress.

But each hour that passes sheds a drop of balm on the most poignant of our griefs. Every new day extirpates one by one the thorns which have pierced the heart. It is true the first months of De Monville's sojourn in the country gave no visible sign of improvement in his health. In vain for him Nature spread forth her beauty and luxuriance; the sunny days, the balmy nights of summer equally weighed down his sinking frame. But by little and little the warmth of summer declines, autumn appears with her empurpled shades and her urn of dew, and with its coming gloom the invalid felt his grief diminish and his health improve. The sadness of the season suited the melancholy tone of his mind, and he at length relieved his sufferings by imparting them.

He was now accompanied in his rambles by his mother and his cousin, and each day saw his intimacy with the latter increase. It was natural that she who had been the confidant of his hopes should be the first to console him. To her alone did he venture to speak of the lost Louisa. In their long walks, now become a daily custom, in the long evenings passed at the fireside, she listened to his wrongs, to his sufferings. She wept for the sorrows he had undergone, and he found his unhappy love half consoled by the tender sympathy of friendship.

She was at length induced to acquaint him with a secret which she had until then concealed, lest she might have increased his afflictions by her own. She had been unwilling to deprive him of a single consolation by letting him know that she herself was unhappy. Her husband, M. Valmont, was dead. This sad news had reached her but a short time before Alfred had found himself so cruelly betrayed.

De Monville was struck with admiration at the inexhaustible fund of kindness which made his cousin ever ready to sacrifice herself for others. This treasure of a heart was now at liberty. Their

conversations henceforward gradually became longer and more frequent, and although they lost nothing of their charming familiarity, they often became timid and embarrassed on both sides. The name of Louisa was less frequently pronounced, and one evening, Alfred, holding Madame Valmont's hands in his, and fixing on her a tender inquiring glance, asked her if she would complete her work and reconcile him entirely to existence.

"We have both suffered," said he. "You, united to a man who could not appreciate your worth, I from a fatal, misplaced passion. We are now both free; you from a chain which was forced upon you, I from a delirium—a dream! We both require the repose of a sincere, tranquil affection. Will you be mine?"

She did not then reply: but two months afterwards their marriage was celebrated at the château. The year following their union was passed in the country. The death of the mother of Alfred, which took place during that period, seemed to increase their affection for each other.

They returned to town about the beginning of the winter. De Monville resumed his avocations, but sought in study, rather than in the enjoyments of wealth and luxury, a diversion to the melancholy which still hung over him, and which now seemed to have become a part of his character. During their long absence, his friend M. St. George had contracted other intimacies and visited him but seldom, and when he did, carefully abstained, by the advice of Madame de Monville, from all allusion to the past.

In addition to his usual occupations, Alfred had his family papers to regulate, to examine title-deeds, and copy a number of letters and other papers. He had requested a friend to recommend him a person to whom he could intrust this copying, and this brings us to the point of time described at the opening of the present chapter.

Alfred, as we have said, was seated in his study. Madame de Monville opened the door and told him the person recommended as a copyist was come.

"Will you see him now," said she, "or shall I desire him to wait?"

De Monville wished him to be shown in immediately.

"Will you allow me, my dear," said his wife, "to remain in the room?"

"Certainly, if you desire it. But as we have to speak of papers, business, ciphers, our conversation will be the reverse of amusing. Why do you wish to stay?"

"I have but spoken a few words to your copyist, and, if I do not greatly mistake the person, he is a most diverting original."

"Oh, remain, then, by all means!"

He ordered him to be shown in.

An old grey-headed man presented himself on the door being opened, and his *début* seemed fully to justify the lady's anticipations. He was attired in a very old surtout, which, perhaps, had originally been black, but, from exposure to wind and weather, had become a kind of ambiguous brown. It was buttoned to the topmost button, as if to disguise the absence of a waistcoat; his trousers, of the coarsest material, were so short, as to leave a considerable distance between their nether extremities and his shoes, or rather *sabots*, for this part of his costume was made not of leather but of wood, such as are worn by the French peasantry and individuals of the very poorest class in Paris. With all these indubitable marks of extreme pov-

erty, there was a something in his aspect which created a liking, and even commanded respect. Though somewhat bent by age, he was tall and uncouthly massive of frame, and the broad German cast of his plain features bore an impress of extreme simplicity and a kindness of heart which not all the marks of pinching want and privation, too visible in every lineament, could change or conceal.

As the door was opened, this strange-looking figure stopped at the threshold to make an awkward, over-polite bow; a manifestation of respect which he thrice repeated, advancing a step at each salutation, with a solemnity so ludicrous that Monsieur and Madame de Monville had considerable difficulty in restraining a burst of laughter. When the poor man had concluded this ceremony, he raised his eyes and cast a bashful, humble look around the room. Suddenly his features assumed an expression of extreme surprise, and he remained with his mouth open, gazing bewilderedly upon De Monville, who, to the great astonishment of his wife, exclaimed in a tone of animation unusual with him—

"What! my old friend, Reinsberg?"

"M. de Monville," said the old man, "how kind of you to remember me! not to forget the professor who taught you the rudiments of an art now despised, and of which I am, I fear, the last representative!"

De Monville here introduced the old man in form to his wife, as having been professor of writing at the College Charlemagne when he was a pupil. The cordiality of his reception put the old man quite at his ease.

"It was very different," said he, "at the time I gave you your lessons, now more than eighteen years ago. I beg pardon, madam, if I speak so freely before you, but I grow young when I think of bygone times. Do not, I entreat, pay attention to my wardrobe. I have brushed and cleaned these poor habiliments as well as possible; but they are very, very old, and miserable. I was ashamed to knock when I saw this rich hôtel; and probably if you had not accidentally been here, your servants would not have admitted me, but turned me from the door for a beggar. This thought made me timid, and I fear you must have thought me very ridiculous in presenting myself as I did. Such, madam, is poverty, humiliating both to mind and body; for I once knew how to enter a room in a proper manner, and have often scolded and punished young ladies as rich and as charming as yourself."

Madame de Monville smiled with such kind affability, that the poor professor felt quite at home.

"Indeed," said he to De Monville, "I am delighted to see you!"

"And I also," said De Monville, shaking the old man kindly by the hand.

"Come, you are still the same—kind, and without pride; you set me so much at ease that I will ask permission to sit down at the fire while you explain what I can do to be useful to you. It is long since I saw any fire in my own room, save that of a candle, and I go to bed often with the sun."

He drew an arm-chair towards the chimney, sat down, stretched out his legs, placed his elbows upon his knees, and held his wrinkled hands to the fire.

De Monville, who found his old professor as simple and good natured as formerly, looked at him with complacency.

"I see, my poor old friend," said he, "Fortune has not been kind to you: but since you sometimes thought of me, why did you not come to see me! You would have been always welcome."

"I was, perhaps, wrong; but you who have been always rich know but one side of charity. It is easy to give, but it is difficult to beg."

"Well, at all events, I thank the chance that has again brought us together. There is something here to employ you for a few weeks, and you must allow me to set my own price upon your work."

"We must fix a fair price, sir, and the little talent I have remaining is at your service."

"You live in our neighborhood?"

"I occupy a small room in the Rue St. Romain, No. 4."

Reinsberg did not perceive that his answer startled both De Monville and his wife. A short silence ensued, during which they looked at each other with an air of constraint.

"Come, sir," said the old man, "what am I to do for you?"

De Monville placed before him the packet of papers he wished him to copy; and the old man was about to depart, but Alfred detained him. Afraid to interrogate him openly, the words, "Rue St. Romain, No. 4," rang in his ears. If his wife had not been present, he would have questioned him at once on the subject nearest to his heart.

"And what have you been doing these many years?" inquired De Monville.

"Something that ill-suited me. I lost my situation as a writing-master in a school, and my pupils fell off, not because I was unable to teach, but because a new style of tuition had come into fashion, by which the entire art of caligraphy was taught in a dozen lessons. What could I do? I was forced to take a little shop, or, more truly, a stall, and became a public letter-writer. The trade was, perhaps, more profitable than that I had lost; but it made me a kind of accomplice in so many intrigues and so much wickedness that I became disgusted with it. More than once I thought of giving it up; and a circumstance which, in spite of me, troubled my conscience—a letter I had been weak enough to copy for a miserable reward, made me at length finally abandon it."

"A letter?" said De Monville, with seeming indifference.

"Yes, an anonymous letter, which contained a most serious accusation. I must tell you, I always held in contempt accusations that the authors were ashamed to sign. My opinion through life has been, that truth can show itself barefaced anywhere. Don't you think so, sir?"

"I do," said De Monville, so much taken up by the old man's discourse that he did not look at his wife, who had become of a deathlike paleness. "But how could this letter affect you so much as to induce you to give up your business?"

"Because it might have injured, or, indeed, have been the death of, an innocent person; it might also, it is true, have enlightened another and unmasked the blackest perfidy."

"And why," observed Madame de Monville, in a calm voice, but not free from a certain tremulousness—"why, for your own tranquillity, not believe the second supposition as probable as the first?"

The poor professor lifted his eyes to heaven and sighed.

"Once I could have done so, madam, but now —"



"Now!" repeated De Monville.

"Now I cannot," said Reinsberg, sadly. "It was a presentiment, too soon, too fatally realized!"

"Of whom did the letter speak?" asked De Monville.

"Of a young woman."

"And to whom was it directed?"

"That I never knew. It was a boy who brought it me to be copied, and he had orders to have the direction written by another person; nor would he inform me whether he had received his directions from a man or a woman. Such mystery made me uneasy; the singular precautions taken appeared to me so strange and sinister that I had a superstitious foreboding of evil to spring from it. It was not the first time I had felt my apprehensions excited by such letters, but never to such an extent. The more I reflected the more convinced I became that I had made myself an instrument of evil to the innocent by this deed. So I closed my shop and took up my residence in Rue St. Romain. The first two nights I passed in my new habitation were calm and silent; but, about the middle of the third, I heard stifled moans as of a person in extreme suffering. The next day I was informed that the apartment opposite mine was occupied by a young woman, whose life was despaired of.

"A few days had elapsed, when one afternoon, as I returned home, I was surprised to see her door standing wide open. I looked in—no one in the first room; I called—no answer; the silence was alarming. I entered the inner room, and there I saw, stretched on a bed, the pallid, inanimate form of a once beautiful young woman. I replaced her poor head, which had fallen off the bed, upon her pillow; and, by the aid of a bottle of salts, which stood on the chimney, after some time restored her to consciousness. I found, on inquiry, that her servant had left her that very day. Without inquiring into her pecuniary resources, I hired a nurse. She had, fortunately, a few pieces of gold, and the unfortunate Mademoiselle Chate-nay, for I forgot to tell you her name——"

De Monville rose with a convulsive start, and Reinsberg, interrupting himself, saw him pale as ashes, his face bathed in tears; he looked at Madame de Monville, despair seemed written upon every feature. Her husband approached her; he took her hand and said—

"Matilda, these tears, which flow in spite of myself, are an offence to your love. I feel it; pray leave the room, and forgive me!"

She looked down, and replied in a low voice, but in a tone of indescribable anguish, as she withdrew—

"I knew you still loved her!"

Reinsberg had risen also, he was confounded, and when he saw himself alone with De Monville, he scarcely knew whether he ought to go on or not; but Alfred, delivered from the restraint he had until then imposed upon himself, seized his arm with frantic eagerness, and exclaimed—

"Is she dead?"

"Yes."

De Monville sank on a chair, and covered his face with his hands. For a few moments he successfully endeavored to suppress his feelings, but the effort was beyond his strength: and his whole frame became shaken by an agony of grief. After a few minutes he rose, and, pressing the hand of Reinsberg—

"Excuse this weakness, my old friend," said he.

The old professor wiped his eyes, but he spoke not.

"And she was calumniated?" said Alfred.

"She was."

"Who told you so?"

"Herself. The proofs of her innocence are undeniable."

"What proofs? Explain—tell me all you know!"

"Her sufferings were long protracted," said the old man, "and I passed whole days and nights by her bedside. I tended her as a father, and gained her entire confidence; she told me her miserable story; that the day before that fixed for her marriage, her lover came to her residence excited to madness by an anonymous letter, in which she was accused of infidelity to him. She showed it to me. Judge of my feelings when I recognized my own writing! It was the letter about which I had felt such an ominous presentiment. I besought her—for, as I had involuntarily injured her, I wished to repair the wrong I had done her—to tell me the name of the person to whom the infamous calumny had been written, that I might acquaint him with his error. She was inflexible. 'It is too late now,' said she, laying her white thin hand upon her bosom, 'death is already here. Why importune him? Let him forget me, though it is cruel to be thus forgotten. I still love him so tenderly, that it would be yet more cruel for me to know I had afflicted him with unavailing regrets.' Her dying agony was long, and she bore her sufferings with a resignation more like that of a heavenly spirit than a poor being of human clay. One evening the nurse and I were seated near her. She saw my tears, for I had begun to love her as my own child, and the hour of separation was visibly at hand. 'Nay,' said she, in her low angelic voice, 'do not weep, my last, my only friend, but rejoice, for your poor Louisa's sorrows and sufferings are at an end.' My hand was in hers, I felt a faint pressure, and all was over!"

No words can do justice to the feelings with which De Monville listened to the old man's tale. For some time after he had closed his mournful narrative, he remained gazing silently on the ground. At length, suddenly starting to his feet, as if his last refuge lay in doubt, he approached Reinsberg.

"You say she was calumniated, but the proof?—where is the proof?"

"Listen," said the old professor. "It appears that she had satisfactorily explained the visit of a person mentioned in the anonymous letter. The circumstance which occasioned the rupture was the abstraction of a ring. This ring she was accused of having given to her pretended lover, and she was unable to account for its loss. Now this ring had been stolen by her old servant, a woman named Marian, who had been bribed to purloin it from her desk. The day I first saw poor Louisa, this wretched woman, stung by remorse, had suddenly left her, but had left behind her a written account of her crime, without, however, naming the person who had bribed her. She had laid this letter on the bed of her dying mistress during her sleep, not daring to confess it herself, and supplicated her pardon. Louisa fainted on reading the letter, and then it was I first entered her room, as I have told you."

"Enough, enough!" said De Monville. "It was I who received that anonymous letter, I who murdered the unfortunate Louisa! But who can

have formed such an infernal plot! Had my poor lost angel no suspicion?"

"She mentioned no one, but she spoke to me sometimes of a friend of her intended husband's family."

"M. St. George! Ah! he it was, without a doubt! my mother's confidant. Could they have plotted together! Oh, no, no! my mother could not—would not! No, he acted alone. I remember his opinions on the subject."

"If you were more calm," said Reinsberg, "I would give you the proof you require—the original of the letter."

"Have you got it still?"

"Yes, I kept it: I have it at home."

"Bring it me to-morrow—nay, this evening—this very moment—I must have it. Let us go for it at once!"

When the old professor saw the eagerness and the sinister expression of satisfaction which lighted up the features of De Monville, he repented having owned that he had the letter still in his possession.

"We could not find it now. I must search for it," said he. "Perhaps I have mislaid it. Besides, I will not give it you till I know what you intend to do with it."

"I want a proof, that's all," replied De Monville, with apparent calmness.

"Very well, I now take my leave, and will bring it you to-morrow, if I find it, as I trust I shall."

It was dark. Reinsberg took leave of his friend, and returned to his humble home. He was nowise embarrassed about giving him the letter he desired. He had merely thought it prudent to take some precautions respecting the use he intended to make of it, and the assumed calmness of Alfred had completely satisfied his more than pacific nature.

De Monville did not think his old friend quite so simple-minded as he really was; for as soon as he was alone, he said to himself, "He will not bring it me; but I do not want it."

An hour afterwards a servant was despatched to carry three letters; two were directed to a couple of De Monville's friends, the third was to M. St. George.

#### CHAPTER V.—THE UNEXPECTED VISIT.

SCARCELY had ten minutes elapsed after Reinsberg's return home when he was disturbed by a low tap at his door. As he was busily occupied in looking over his old papers to find the manuscript he had promised Alfred for the next morning, he did not answer the summons. Indeed, as he expected no visit and had heard no one ascend the narrow staircase, he concluded the noise must have been occasioned by some window left open, and agitated by the wind. He, therefore, quietly continued his search. In a few seconds his attention was again drawn to the sound of somebody groping at his door, evidently feeling for a bell-rope. Alas! a bell was an article of household luxury long unknown among Reinsberg's domestic chattels. Soon after the visitor gave an audible knock.

"Who's there? What do you want?" said the professor.

The stranger returned no answer, but knocked again.

"Come to-morrow," said the old man. "Come back to-morrow; I am in bed, and have no light."

Unfortunately, the light was seen through the chinks of the door, and contradicted his assertion.

"Open! pray open!" said a gentle, timid voice. "You have nothing to fear. Do you not recognize me?"

Reinsberg opened the door. A female covered with a veil entered with precipitation. She appeared a prey to the most violent agitation. She removed her veil to breathe more freely, and the old professor uttered an exclamation of surprise on seeing the alteration a few hours had wrought in the features of Madame de Monville.

"Shut the door," said she.

Before he did so, Reinsberg looked down the staircase.

"You are alone, ma'am!"

"Nobody knows, or is to know, I am here. If ever you should be interrogated on the subject, swear you will not betray me."

"Madam," replied the professor, whose surprise was increased by the excited manner of his visitor, "I do not like to bind myself by an oath, which it is sometimes both difficult and painful to keep. Be kind enough to let me know the motive of your visit."

"I conceive your prudence, but fear nothing. The discretion I require is far more necessary for me than for you."

She looked around the room, and, after a pause of a few seconds, added, "We must speak low, must we not? Our conversation can be heard in the next room?"

"Yes, madam, it was in this room I overheard, without listening, the moanings of the unfortunate Louisa. You had left the room, madam, when I terminated the sad recital."

"Yes, yes," interrupted she, in a brief, agitated voice, "this Louisa is dead: I know that."

"Ah, your husband has had time to relate it to you since I left!"

"I have not seen him."

"Is he aware of your being here?"

"No."

"But, madam, should he remark your absence this evening?"

"This evening! oh, he'll not think of inquiring about me this evening! I am far enough from his thoughts."

Notwithstanding his want of penetration and his complete ignorance of the passions, Reinsberg began to guess the secret pain which had so altered the charming features of his visitor, and given them such an air of wildness. He remembered the tears De Monville had striven in vain to conceal from her, the words he used when he prayed her to withdraw. He saw that jealousy had stung her to the heart. Still he could not discover the motive of her visit to him. She motioned him to take a seat at her side.

"You have kept the copy of the anonymous letter?"

Reinsberg looked at her with surprise, not clearly understanding whether she interrogated or affirmed a fact she was certain of.

"You have kept it. You are to give it to-morrow to my husband. Do not endeavor to deny it. I was in the next room, and overheard all you said. You must give me the copy of that letter."

"I have promised it, madam, to your husband."

"To him or to me, what does it signify?"

"If you were here with his consent."

"You will tell him you have mislaid it, and he will believe you without hesitation. You told him you were not quite certain of finding it."

"I greatly fear I spoke the truth."

"No; you first declared you had it in your possession, and I see you have already begun to look for it. I must have the copy of this letter!" said she, with energy, increasing to wildness. "Give it me—sell it me! Set on it what price you will. I must have it. You are poor, and I can make you rich!"

Though she spoke with such rapidity that Reinsberg could not interrupt her, she had opened her reticule.

"Take this," continued she; "here are four bank-notes of 1000 francs each!" Seeing the poor professor's look of bewildered astonishment, she took it for sordid hesitation. "It is not enough, I know it is not. I had no more in my desk. But you shall have whatever you desire; triple this sum, 20,000 francs, if you demand it—my whole fortune. Besides, here are my jewels. Look, take them!"

Her features, lately so pale, were now flushed and animated, her eyes shone with unnatural lustre, her hands, with a motion so rapid as to be almost imperceptible, emptied her reticule. A necklace of the finest pearls, rich jewelry, diamonds, rings, fell in a shower upon the table.

The poor man looked at her in utter bewilderment. There lay before him more money than he had seen throughout his whole life. And this unlooked-for fortune was thrown at his feet—all his own; he had but to extend his hand, and it was his. But these were not the thoughts which dwelt upon his honest mind. Between the wealth he had never known, and the destitution which was abridging his old age, no idea of speculation rose even for an instant; and it was with tears in his eyes, and in a voice tremulous with pity, that he said—

"How unhappy you must be, madam!"

"Yes, I am unhappy; but it depends on you that I cease to be so. You can restore me to repose, to happiness! Will you accept my offer?"

"The recital of this melancholy event has revived the remembrance of past affections. I ought to have perceived it and interrupted my story when he requested you to withdraw. I should not have reopened an ill-closed wound. You must pardon me, madam, for the ill I have involuntarily caused. I had still present to my memory the death of this poor girl, so infamously calumniated. Had you known her as I did, madam, had you heard her protest her innocence, you would not now require this undeniable proof to be convinced of it. But pardon, madam, I am again afflicting you, and forget what I did not know till now, that love is jealous even of the grave. You tremble lest the memory of one he formerly loved should rob you of a part of his tenderness. I shall ever, madam, reproach myself with having occasioned you this distress. But how can the possession of this letter restore you to happiness! What can make you desire it so ardently as to be ready to purchase it at the price of your whole fortune?"

Whether Matilda had no satisfactory answer to give to this question, or was too much agitated to reply, we cannot tell, but she remained silent.

Reinsberg continued—

"When I found M. de Monville so determined on having this letter, I was afraid he might know the writing, and that it might lead to a duel with the author of it. He convinced me these apprehensions were groundless. But what must I think now?"

"Yes," exclaimed Matilda, seizing the idea

thrown out by the old professor, "your friendship for him anticipated the danger my love would prevent. I fear for his life. You now understand why I came here at this hour of the night—why my coming must remain a secret. I know—no matter how—I know who wrote this letter; my husband will recognize the hand, he will challenge the writer, and I shall lose him a second time through this wretched girl. Give me, then, the letter—let me annihilate this proof; and when the fact is reduced to a mere suspicion, when the writer can deny it with security, I shall be happy—at least, delivered from all fears for my husband's life. The letter—the letter! On my knees I entreat you to give it me!"

"Rise, madam," said Reinsberg, "I regret too deeply what has taken place not to restore you to peace if it be in my power. But take back your money and your jewels. I shall accept of nothing; it is a reparation that I owe you, not a proof that I sell."

And so saying, the noble-minded old man returned Madame de Monville her money and jewels. He then rose and went to his desk, and having looked over the papers for a short time, returned towards her. On beholding the sheet of yellow paper he held in his hand, she sprang forward and seized it with a convulsive grasp. As she perused it, the extraordinary change of expression her countenance exhibited would have been ill explained to a more penetrating eye than that of Reinsberg by the pleasure of preventing a duel: her joy was a species of delirium. It seemed as if the stronger of the opposite dispositions combined in her character—a contrast we have already remarked—had broken loose, and, disdaining all control, all dissimulation, burst through the wall of iron which had so long compressed it. Her features seemed to have taken another character. She was no longer a gentle, timid, supplicating woman, but a lioness. And as if her hands were not sufficient, she tore the letter with her teeth, collected every particle of it, and burnt it piece by piece at the candle. As it consumed, her brilliant eye followed the progress of the flame, as if it had been the suffering of an expiring victim. When all was destroyed, she blew upon the black ashes, and dispersed them with a breath.

"Nothing more—nothing more—not a trace—the letter never existed! Saved, saved!" exclaimed she; "I am saved!" And she laughed, she wept, in a breath. She clasped the old man round his neck before he had time to express his surprise at her frantic joy.

"It is to you I am indebted for my happiness," said she. "Never, never shall I forget it! You have refused my gifts, but come and see me; my fortune is yours, as I have already told you. Farewell!—it is late. I have your word. You will be discreet, will you not? Farewell—farewell! Do not come out, I need no protector. My only danger is past."

She opened the door, sprang to the staircase, and, despite the darkness of the place, such was the lightness of her tread, that Reinsberg could scarcely hear her step. The street-door closed, he turned to the window, and through the glass, dimmed by frost and snow, he perceived, by the faint light of the lamps, a slight female figure turning the street-corner.

The old professor was some minutes before he recovered himself, and then a thousand different ideas crowded themselves into his poor brain. An



evil thought was the last he could conceive; and if the thoughts of his hopeless penury for a moment intruded, it seemed as if the gifts he had refused would have laid heavy on his conscience had he accepted them.

He wrote to De Monville, and told him that he had searched in vain for the letter; that he had kept it a long time, but that it was no longer in existence. He went to bed, but he could not drive away the vague forebodings of evil which haunted his mind.

#### CHAPTER VI.—EXPIATION.

MATILDA returned home; her husband had not inquired for her. The next morning at day-break, De Monville rose from the secretary at which he had been writing since the preceding evening, after having received answers to the three letters which he had despatched. He read over some letters and sealed them. One, a very long one, and bathed with his tears, was directed to his wife. Another, which covered several sheets of paper, was to be delivered to his notary, to whom he had intrusted his title-deeds: it contained his will. He placed them both in his pocket-book, and left the others on the mantelpiece. His wife's apartment was separated from his by a small room, the door of which opened into his library. He laid his hand on the lock, and paused to listen; all was calm.

"She is asleep," said he; "I can go out, and, if Heaven be just, return without having disturbed her rest. In two hours it will be all over; he or I—I must go!"

He muffled himself up in his cloak, took a case of pistols from the table, and turned the key gently in its lock. At the same instant the door opened on the other side, and he found himself in the presence of his wife, pale, haggard, and in a dress which attested that she had been up all night.

De Monville drew back some steps. Matilda entered the study, pushed the door to with violence, and without a word, without asking or giving an explanation, with a rapid and imperious gesture, she opened his mantle, and snatched the case of pistols from her husband's hands.

"You are going to fight a duel?" said she.

De Monville, who had scarcely recovered from his surprise, replied—

"I am this morning to act as a second to one of my friends. Do not be uneasy, my love, and let me go."

"You cannot deceive me; you are going to fight a duel!"

"My dear—"

"No useless words, no false oaths! You are going to fight; no one has told me so, but I know it."

"Fight!—For what!—With whom!"

"With whom?—with the man who you suppose wrote the anonymous letter, and whom you think you know. Why!—to revenge the death of a woman you have always loved, always regretted. I know it to be so. Does not the heart feel its abandonment? Does jealousy require to be warned? Does it want eyes? Did I not see you yesterday, while the old man was speaking to you, entirely absorbed by the remembrance of your mistress? You thought, indeed, of me—poor, abandoned creature!—but only to tell me to withdraw, and not to disturb your affliction by my presence. And do you think that because I retired I neither saw your tears nor heard the resolution you took?"

Now tell me again you are not going to fight a duel!"

"Matilda," replied he, in a low, solemn voice, "it has always been my fate to test too severely the inexhaustible goodness that makes you an angel. You alone were just towards her whom your title of wife to-day makes you detest. When I was sinking under my grief for her loss, you alone consoled me. For two years past, every day has witnessed fresh proofs of your devoted love; and, believe me, without the unforeseen revelation of yesterday, which has cast me so violently back upon the past, no complaint, no regret, no sign of remembrance, should ever have escaped my heart. Seek, then, my Matilda, in that virtue no woman but yourself possesses, fortitude equal to the trial of to-day! Yes, I am going to meet an antagonist. I no longer endeavor to deceive you. You have nothing to fear from love, for it is not in the power of revenge to bring back to life the being I have adored; but the wretch by whose slander she perished, must receive the just reward of his infamy. To-day, to-morrow, twenty years hence, as long as my arm can wield a sword, or aim a pistol at his heart, I shall seek satisfaction and revenge for the death of poor Louisa. I wished to avoid you; I dreaded your tears, your reproaches, your despair! But my last thoughts were for you. Here is the letter I wrote to you, in which I bade you farewell. Receive it now, since a fatal chance has placed you on my road. Do not endeavor to detain me. It is a reparation I owe, and in risking my life I expiate in some sort my wretched credulity, and the error I should have been the first to disbelieve."

Matilda stood before him dumb, motionless, her hands joined; but when she saw him preparing to depart, she seized him violently by the arm.

"What!" cried she, with an accent of concentrated rage, "I must be again resigned! patience, forever patience! Another can know the passion, feel and awaken a heart to love; but my lot is ever the coldness and the insensibility of the marble! No, no; it shall not be thus. You ask too much; you ask for one act of virtue more. I ask of Heaven but to preserve my reason, which I feel ready to abandon me, to prevent the fatal secret of my heart ascending to my lips; that my voice may expire before, in my madness, I reveal the terrible truth!"

"What do you mean?" demanded De Monville, alarmed, and, in spite of himself, impressed with a vague foreboding of something horrible, "What does this folly imply?"

"Must I again explain why I suffer! Can you deceive me? Was this woman, then, so very beautiful? She must have been so, since even the recollection of her is stronger than my love! Tell me how could she have loved you with a passion deeper than mine?" Here Matilda threw herself madly upon her knees before him. "Promise me," said she, "that you will not go—that you will forget this woman—for my sake—for me, a bewildered, wretched suppliant at your feet!"

De Monville was moved, but not shaken. He felt the distress of his wife, and knew how violent must be her grief to dictate such passionate and incoherent language. But her words fell upon his ear more than upon his heart. Since the eve, his whole thoughts, his whole soul, were devoted to the memory of Louisa. He disengaged himself, and advanced towards the door.

Matilda rose precipitately, and gazed on him for

a few seconds, as if to be certain he was going to quit her.

"And so," said she, "you leave me! All I have said to detain you is vain. You mean to go!"

"I must,"

"And return here avenged or dead?"

"Yes."

"And you leave me during your absence to my solitude and despair! In the presence of your adversary no thought of me will make your heart beat quicker or your hand less steady. And what awaits me? You will return to deplore her loss, or be brought back a corpse—perhaps, a dying man, whose last accents I shall hear repeating the name of Louisa. Oh, on such terms I would rather, a thousand times rather see you dead at my feet! Alfred, Alfred, you cannot know the agony you cause me! You cannot know that you are driving me to madness! But," she exclaimed with sudden vehemence, and placing herself before the door, "you shall not go—you shall not fight! Who is your antagonist? St. George, is it not?"

"Who else can it be?"

"And if he refuse?"

"He will not refuse. I have received his answer."

"But if he deny having written the letter, what will you then do?"

"I will brand him as a coward. I will collar him with one hand, and strike him to the earth with the other."

"And then he will fight, and you will perish! Hear me!" said she, approaching him, and speaking in a hoarse, unnatural whisper, "it was not he who wrote the letter."

"Who then?" asked De Monville, with a fearful apprehension of the truth.

"One whom you cannot strike. One who cannot, will not let you expose your life. One who, on her knees, again beseeches you to remain; whom her love for you alone has rendered criminal; whose love for you now betrays her. It was I!"

At this frightful revelation, the features of De Monville assumed a ghastly hue; he laid his hand on the chimney to support himself, but speedily recovered.

"You—you!" repeated he, after an interval of terrible silence.

"Yes, I!" said she, endeavoring to take his hands; but he shuddered at her touch, and cast her violently from him.

He looked earnestly upon her, and in an instant, as it were, all was explained; his mind fathomed the depths of that profound dissimulation, the abyss of that heart, a volcano burning beneath its snows. At length, he cried—

"What had she done to you, madam?"

Matilda advanced towards him.

"You ask me what she had done. SHE LOVED YOU!—that was her crime. Do not ask how I was informed of the visits of M. Preville. I was jealous. With gold I bought all the secrets I wanted to know. It was I who wrote the letter, and took every precaution related by the old professor. Yesterday evening I went to his lodging, obtained the paper written in my own hand, and destroyed it. I bribed Marian, and she stole the ring which was to serve as a proof against her mistress. I did all this, and it seems to me a dream; I can scarcely believe it myself. I cannot even think I have revealed my dreadful secret to you. Alas! my reason wanders. But why have I

spoken? Because your life was in danger—because I desired to save you!"

"It was, then, to you her servant delivered the ring?" said De Monville, with a look of indescribable fury. "Give it me!"

"It is no longer in my possession—I have not got it. Your looks terrify me—your voice makes me tremble! Have you no pity for me!"

"Had you any for her?"

"Her, always her!"

"Do you forget she is dead—that you are her assassin? Pity for you!" said he, with a frightful laugh; "pity!—never, never!"

"And have I not suffered! Have I not been jealous? Am I not still so? Did I not suffer when, victim to a passion which has made me the wretch I am, I saw you day after day leave the house to visit her? Did I not devour my tears in silence? Calm and insensible to all appearance, did not my heart beat with joy even at the sound of your footsteps? Did I not tremble with rapture at the tone of your voice, or when your hand touched mine? And what has been my lot for the last two years? During the day, SHE, SHE alone occupied your thoughts. At night, in your dreams, her name alone was on your lips. Did I ever complain? And to-day, when the fear of losing you has driven me to madness, and forced me to speak, you cast me from you without pity! Your eyes have not a tear for my agonies, your heart not an excuse for my guilt—guilt occasioned by excess of love! She could die, for you loved her. But what will be my fate, to live, if you love me no longer? Oh, pity me, Alfred—pity me, pity me! Let fall on me but one look of former times—of yesterday, and I will leave you! You will deplore her loss; and when the bitterness of grief is past, I will return—I will kneel to you and crave forgiveness!"

She had crept close to him; he thrust her back again.

"Infamous woman!" exclaimed he. "Give me the ring, if you still possess it!"

"What will you do with it?"

"Cover it with kisses before your eyes, that you may witness, before our eternal separation, how fondly I loved her to whom it belonged!"

"Separation!" exclaimed Matilda, rising with the energy of despair—"separation! Ah, this is too much! You think me weak and trodden down to earth! Separation! Am I not your wife? How will you obtain it? Will you say I killed your mistress through jealousy? Where is the proof!—The letter! I have destroyed it! Never will I quit you with life!"

"Madam, after this hour, we shall never more see each other on earth."

"Every day—I will daily importune you with my love, my complaints, my jealousy!"

"Silence, madam, silence!"

"Ah! you think you have suffered because you have lost a mistress; and another woman, whose mind you have distracted, obtains from you, as the price of her love, but threats of a separation. No, no; we are bound, indissolubly bound to each other; no power on earth shall separate us. Our life may be a hell, but, accustomed to suffer, I accept my lot."

Wild and distracted, she had seized her husband's arms, who vainly endeavored to free himself, and who felt himself provoked beyond endurance. At this moment the study door was suddenly thrown open, and three men entered. De Monville, making a last effort to disengage himself,

pushed his wife rudely from him. She staggered and fell to the ground.

Alfred turned to the intruders.

"Gentlemen," said he, "the hour fixed for the duel is past; without doubt, M. St. George, this is the object of your visit. An instant later and I should have been on my way to apologize for the letter I wrote you yesterday. Pray accept my apologies! You see the cause of my delay—a domestic quarrel, which I cannot hide as I have done the preceding ones. My wife desires a separation, which I would not consent to. But I no longer object to it. Your testimony\* as to what has

\* It may be necessary to explain to the English reader, that in France it is necessary to prove an act of violence on the part of the husband to afford grounds for a claim of separation made by the wife.

## TWO SYSTEMS OF ASTRONOMY.

A VERY CURIOUS production, entitled *Two Systems of Astronomy*, has been issued by a Mr. Isaac Frost. The author, a shrewd man on some points, and a sturdy reasoner, undertakes to prove that the Newtonian system is entirely false, and that the Mosaic account of the Creation is to be taken in its exact and literal sense. He maintains that things are, as we see them by the eye; that the sun and stars revolve round the earth, which is the great centre of the universe; and that the firmament is a material concave separating us from heaven. In his view the real size of the sun does not greatly surpass its apparent size; the moon shines with a lustre of her own, and the stars are mere spangles set in heaven to heighten the glory of creation. The author clings to his convictions with the sincerity of undoubting faith; and has illustrated the two systems of astronomy, that of Newton, and that of the Scriptures, (as Mr. Frost terms his own theory,) by a number of beautiful plates. Some of his objections to the Newtonian system are subtle, and he pounces on the vague and extravagant assertions of those astronomers who love the marvellous more than the exact with great dexterity. As for example in this passage:—

"A gentleman once said he would convince me of the error of my (what he termed) foolish notions in about ten minutes, and for this purpose he introduced 'Bonnycastle on Astronomy.' Opening the book, he showed me the following passage, and requested me to read it, and say what I thought of it:—

"The celebrated Huygens carried his thoughts so far upon this subject as to believe that there might be stars at such an inconceivable distance from the earth that their light, though it is known to travel at the rate of ten millions of miles in a minute, has not yet reached us since the creation of the world!"

"When I had read the aforesaid, I asked him if it had ever crossed his mind to think how many of the other stars' light the light of such stars would interfere with in their progress to our earth, seeing their light expands as it travels? when he closed the book, saying such an idea had never entered his mind before."

The author apparently belongs to some peculiar sects of religionists, as the Muggletonians, or some body of the kind. It is interesting to observe the

just taken place shall be my punishment for an act of brutality I blush for too late."

He drew near his wife, and said, in a low voice—

"Madam, if you refuse to agree to a separation, I will dishonor you in the eyes of these gentlemen by acquainting them with your crime."

A month afterwards the separation was legally pronounced. Two months had scarcely elapsed, when De Monville appeared in mourning for the death of his wife; and before the year was over, Reinsberg followed a rich funeral, which came out of an hôtel in the Rue de Grenelle.

The old professor was handsomely provided for by his friend, but he never quitted his humble garret in the Rue St. Romain.

stoutness with which he maintains his opinions, holding the evidence of his own sense against all deductions of reason, and asserting the probability that the sun is not above six miles distant, and that the firmament is the veritable floor of heaven. Such a man in these days is a marvel. We are afraid he has been born some centuries too late. Had he lived in the age of Galileo or Columbus he would have been an ugly customer for either. It may be imagined that when he comes to deal with the mathematical reasoning necessary to the higher astronomical calculations, his conceptions are very vague and cloudy. Thus, for example, he asserts that the earth *cannot* be more distant than three times its own radius from the sun. The proof of this is so badly expressed that it is almost unintelligible; but after many efforts we find that it involves either the absurdity of supposing that two tangents can be drawn to a circle through the same point in its circumference, or that the difficulty is overcome of seeing through a stone wall at the equator—a fact which has hitherto escaped the observation of experienced navigators. The objections urged by Mr. Frost to the Newtonian theory are, such of them, at least, as can lay no claim to originality, plausible enough. Such are the small visible alterations (to the naked eye) of the planets, great alterations of distance notwithstanding, and the apparent impossibility of return in a planet when farthest removed from the sun, on account of the weakness of the sun's "attraction" at a distance; but these objections have been satisfactorily answered over and over again. One word only on his assertion that the book is the result of many years of careful study. There is no doubt of it. But we must value works according to the grasp of the mind that produces them, not according to the time employed in their composition. A dog is a very intelligent animal, yet he could never be brought to work a rule of three sum that is mere play to a schoolboy. Have we said enough to show how it is that Mr. Frost cannot comprehend Newton's theory? The volume has been got up at some expense, and the astronomical illustrations, printed in oil colors, are extremely beautiful. It is altogether a curiosity—an offering at the shrine of sincerity which few persons have the heart to make. If higher intellects would imitate Isaac Frost's courageous honesty the world might be the better for their labors.—*Britannia*.



## CHAPTER IX.

PUNCTUALLY each day I visited this fish-pond; and each day observed the increasing sagacity of the finny-creatures. I am now very certain that, as my dear father used to say, we much underrate the moral perceptions of fish. I now believe with him, that fish think. "Who shall say," my respected parent was wont to ask, "that a lobster does not reason? Take a lively lobster: put him in a saucepan full of cold water; then put the saucepan on the fire. As the fluid becomes heated, conveying strange sensations to the lobster, he begins to reason—to suspect that he is not in the sea. Faintly, languidly, perspiring, he gropes with his claws for the ocean bed; and they move scratching against a piece of iron or tin that he knows is neither rock, nor clay, nor shingle. And then, too late, he feels that he is being cooked; and as his life ebbs away in hot and boiling water, he sees, with his projecting eyes, into the future. He sees himself as scarlet as a soldier of the line. And then he sees himself placed in a dish; and one, or two, or three gentlemen, with twinkling eyes, looking down upon him. And then he feels himself passing in small pieces down the throats of the two or three gentlemen, who smack their mouths, as though they would never have a bellyfull. Now the lobster," my dear father would say, "feels, though he has not words to express as much; the lobster feels, as I began to feel when I got into the court of chancery; even as I felt when I found myself chewed up after the suit had risen to boiling point, and I was completely done." Thus my father would hold forth: whilst my mother would move uneasily in her chair, and with the amiable freedom of a wife, beg him not to make a fool of himself.

And I shared in the risible unbelief of my mother; but then I dreamt not of the sagacity of fish, for I had not angled with a wedding-ring. I was very soon undeceived. Doubtless, the uncaught fish quickly began to take count of the great number of their companions ensnared by that piece of gold wire, and so became shy accordingly. Be this as it may, sometimes for half a day and more would I angle with the ring, and never so much as get a nibble; lots of fine, brilliant young fish, with waistcoats of gold and silver scales, would come floating and swimming, and flirting about the hook, and making-believe to bite; and now, with a sudden twist and plunge of the ail, darting to the other side of the stream. You may be sure that this vivacity, this weariness of the fish, made me frequently moralize; again and again led my thoughts back to a delicious world of routs and dances.

Finding the fish become every day more shy, I laid by my golden hook and tackle for a time; and went abroad, when it was fine, with my pistol, as much for the pleasure of practising at a mark, as to see if I could kill anything that, when killed, I might turn to better account than my turkey. To my great delight, I discovered that the place abounded with rabbits. To be sure, they were as wild and skittish as colts; always running away when they saw me. At length, however, lying down among some high grass, I got a shot; fired, and killed a she-rabbit which, fortunately, had sixteen little rabbits near her. When their mother fell, the poor little things all gathered themselves together and never stirred a foot. Whereupon I took the old one and flung her across my shoulder; at the same time placing all the little rabbits in my gown as in a form, and so carried them all to my

hut. I cooked the old rabbit, first skinning it. "It might have been ermine," I thought, "and then what hopes of muffs and tippets." However, as it was, I felt grateful; for I knew the cold and rainy weather must set in, when even rabbit skins would be better than no skins at all.

And now, I am about to enter into the most dreadful and melancholy relation of a silent life. Consider it, my sisters; a silent life. An existence in which the tongue of woman becomes silent as echo when not spoken to—dear echo! that, lady-like, always has the last word—silent as an untouched lute. As well as I can recollect, it was the 30th of September that, my foot—which I had already imagined dancing upon bleeding hearts in an Indian ball-room—first touched this inhospitable island. After a few days, it came into my mind that I would keep an exact reckoning of the time as it passed. I felt the more secure in doing this, that my journal would be quite private. At first, I thought of putting down the days and weeks on paper—but straying on the beach, an accident determined me otherwise.

It will be remembered, that I spoke of a magnificent mirror that, with all the strength of woman I tore from the state-cabin. This mirror was dashed by the envious and relentless ocean from my raft, and sent, shivered in pieces, to be shared among the sea-nymphs. By a strong effort of the soul, I had wrenched this mirror from my daily thoughts—when, one morning, bending my steps towards the beach—there had been an unusually high tide—I saw, washed upon the shore, that very mirror. Here, I thought, is one drop of honey in my cup of bitterness. I turned the mirror up—it was lying, as I thought, upon its face—and discovered that there was nothing but the frame. The shell was there, but the gem was rifled. There was, indeed, its wooden frame, but its reflecting soul was gone.

Soothing this new and most unnecessary affliction as best I might, I resolved to turn my disappointment into some sort of profit. Whereupon I took the skeleton of the looking-glass, and set it up in the earth. And then upon its sides I cut every day a notch, with double notches for what I recollected were opera nights. And this incident, too, made me prettily moralize. "Had the glass remained," I said to myself—though I do not think, had anybody been present, I should have extended the confidence—"had the glass remained, that, without incision of knife, might have told of departing years;"—told, I must say, more truly than, I fear, I did; for, whether it was idleness, whether it was woman's instinct, I cannot say, but certain it is, I was always behind-hand marking my days—marking, in the long-run, two instead of ten. It may, I know, be urged by the calumniators of our sex, that this on my part was design. But no: I repeat it; I think it was pure instinct—nothing but instinct.

I should observe that, among many things which I brought out of the ship were pens, ink, and paper; but of these I was extremely sparing; resolving to write my life, and not knowing to what extent the materials might extend. I also found in the bottom of an old chest a prayer-book, that, strange to say, had nothing perfect but the marriage service. This, I confess it, was an omen that at first a little revived me. And then, let me add, I was not without a companion. No: there was the cat—the very cat that had seemed to glare and mew perpetual celibacy at me—that cat had smuggled herself among the things upon my raft, and was the tenant of my hut.

After a time, considering my situation, I began to put down my thoughts in writing; making a sort of debtor and creditor account of my position, thus :

EVIL.	GOOD.
I am thrown upon a desolate island, without a blessed soul to speak to.	Then I have this consolation—there's nobody to scandalize me.
I am singled out to be a single woman, when I might have been a wife and a parent.	I might have been married early to a brute, and been a grandmother at eight-and-thirty!

And so summing up this short account, I thought, as my dear mother used to say when she buttered her crumpets, that much might be said on both sides.

#### CHAPTER X.

HAVING now brought myself to look upon solitude and a single life as my future doom, I determined to make the misfortunes, as far as I could, endurable. Looking upon my hut as my home for the natural course of my life, I resolved to furnish it with all the necessaries in my power. The surgical instrument case, of which I have before spoken, was of the highest service to me. It enabled me to cut down a large supply of osiers, which grew in great abundance, as I afterwards discovered, at what I take it was the north-north-eastern by west part of the island. As a child I always displayed great precocity and taste in the manufacture of rush baskets. Indeed, I could make rushes into anything. This faculty was, at my need, of the greatest service to me; and thus, in progress of time, I had completely furnished my hut with chairs and tables and stools, and, at length, a bedstead—for I grew tired of the hammock—of wicker work. Of course, this was the result of a long period; but then, time was of all things the cheapest and most plentiful commodity with me. My furniture, when completed, had a very light and pleasing effect; and, I assure you, made me often think with a sigh of pity upon the vanities of mahogany and satin-wood. As I continued to make improvements in my hut, I found I required a ladder; this I managed to make of rope and wicker; by which means I was enabled to climb into an upper chamber, drawing up my ladder after me. I had seen no signs of a human animal; nevertheless, I thought it was only a proper precaution to be provided against the worst.

The rainy season having set in, I began to write my journal, to which—as it is at this moment in the hands of a distinguished publisher, and will, in the season, appear under the title of *Nights with the Cannibals*—I shall no further allude. (It will be sufficient for me, if the withering satire contained in that aquafortis volume shall be the means of awakening the savages to a proper sense of Almack's and the Italian opera.)

During the time employed upon my wicker-work, I continued to make daily rambles about the island, to see what I could catch. I discovered to my great delight, that the place abounded with ring-doves. I managed to obtain some of the young, which I brought to my hut. These beautiful creatures—emblems of household and conjugal affection—increased exceedingly; and thus, in process of time, I never wanted a ring-dove for my supper. It went to my heart, of course, to kill them, at first; but custom and hunger soon reconciled me to the inconvenience. After a time, rummaging about, I found whole hives of wild honey and wax. The latter was of especial service to me, as, my candles getting every night shorter and shorter, I know not what I should have done for a

light; for to have slept without a candle—and in an uninhabited island—would have been insupportable. The wax, however, with cotton that I unravelled out from some articles of dress, made me very endureable tapers. I had, in my time, burnt better wax; but for home-made lights they were not the worst.

About this time, I was fortunate enough to be visited by an earthquake. I say fortunate; for though, while it lasted, I was very much terrified—and very much wished for one of the earthquake gowns that Horace Walpole, I think it is, says was very much in fashion in his time, when earthquakes used regularly to visit London—nevertheless, as the island and the sea being well shaken, caused the wreck of the ship that lay at the bottom of the ocean, to be thrown high and dry ashore—I was enabled to come at a great many articles that, in my hurry and confusion, I had been unable to carry away upon my raft.

It was on one of my visits to the wreck, that going down upon the beach, I discovered what, at first, I took to be a strange sea-monster, lying upon the shore. At length, after much examination, I concluded that the creature was a turtle. I remembered that I had once seen such a thing at the door of a London tavern, when a child, with my father; and how my honored parent, to my surprise, suddenly paused before the fish, contemplating it with an emotion that, at that time, I was far too young to understand.

With considerable difficulty I carried the turtle to my hut, resolving to dress it. Whereupon I immediately consulted that precious volume, the *Cookery Book*, fortunately discovered in the clergyman's cabin. I knew that I had not the proper means of dressing the turtle, and therefore felt (by anticipation, of course) what the inimitable and immortal Soyer has since delivered to the world. "Is it not bad enough to have sacrificed the lives of these *animaux bienfaisans* to satisfy our indefatigable appetites, without pulling and tearing to atoms the remains of our benefactors! It is high time, for the credit of humanity, and the comfort of quiet families, to put an end to the massacre of these innocents." With these thoughts, I addressed myself to the *Cookery Book*. I knew very well before I opened it that I had not a single ingredient proper for the dressing; nevertheless I took a strange, a wayward delight in reading the directions—they afforded me such pleasures of the imagination. It was something in that dreadful solitude even to read of "a quantity of very rich broth of veal,"—"green onions, and all sorts of seasoning herbs,"—"cayenne and the juice of lemons;" with, as a crowning delight, "two bottles of Madeira!" Thinking of these things, and looking at my turtle—and knowing, at the same time, that it must be eaten plain; not honored by any dressing—so to speak—soever, I could not help comparing its fate with my own. Here it was, a beautiful turtle—a turtle that, in London, would have fetched I know not how many pounds—a turtle that would have gathered about it the choicest company of the land, cooked with exceeding care, and praised with exceeding praises; yet nevertheless doomed to be eaten in a desolate island, without a drop of veal broth, a pinch of cayenne, a squeeze of lemon, or a single glass of Madeira. Thinking thus of the turtle, and pondering upon my own condition, the reflective and sympathetic reader will not, cannot be surprised to learn that—I wept.

Let me, however, conclude this chapter in good spirits. The turtle's eggs I found delicious.